HANDBOOK

BRASS · BRONZE · COPPER

NICKEL SILVER

ANACONDA

THE AMERICAN BRASS COMPANY

HANDBOOK

BRASS • BRONZE • COPPER

NICKEL SILVER

ANACONDA
from mine to consumer
REG. U.S. PAT. OFF.

July 1, 1935

THE AMERICAN BRASS COMPANY

SHEETS
WIRE
RODS
TUBES
DATA

THE AMERICAN BRASS COMPANY

General Offices
WATERBURY, CONNECTICUT, U.S.A.

Manufacturing Plants

ANSONIA, CONN.
TORRINGTON, CONN.
WATERBURY, CONN.
BUFFALO, N. Y.
DETROIT, MICH.
KENOSHA, WIS.

Offices and Agencies

BOSTON, MASS.	140 Federal Street
PROVIDENCE, R. I.	131 Dorrance Street
NEW YORK, N. Y.	25 Broadway
SYRACUSE, N. Y.	207 East Genesee Street
NEWARK, N. J.	20 Branford Place
WASHINGTON, D. C.	1511 K Street, N. W.
PHILADELPHIA, PA.	117 South Seventeenth Street
PITTSBURGH, PA.	535 Smithfield Street
CLEVELAND, OHIO	925 Euclid Avenue
DAYTON, OHIO	32 North Main Street
CINCINNATI, OHIO	101 West Fourth Street
CHICAGO, ILL.	1326 West Washington Boulevard
ST. LOUIS, MO.	408 Pine Street
ATLANTA, GA.	10 Forsyth Street
HOUSTON, TEXAS	609 Fannin Street
DENVER, COLO.	818 Seventeenth Street
LOS ANGELES, CALIF.	411 West Fifth Street
SAN FRANCISCO, CALIF.	235 Montgomery Street
SEATTLE, WASH.	1338 Fourth Avenue

THE AMERICAN BRASS COMPANY OF ILLINOIS
1326 West Washington Boulevard, Chicago, Ill.

In Canada

ANACONDA AMERICAN BRASS LIMITED

Main Office and Mill
NEW TORONTO, ONTARIO

Montreal Agency: 1010 St. Catherine Street, W.

CABLE ADDRESSES

"AMBRAC" ..... Waterbury, Conn.
"AMBRAC" ..... 25 Broadway, New York

All Standard Cable and Telegraph Codes Used

THE AMERICAN BRASS COMPANY

ANACONDA PRODUCTS

ANACONDA metal products comprise copper and copper alloyed with zinc, tin, nickel, lead, aluminum, silicon, manganese, cadmium and beryllium in all combinations that can be wrought into the following forms:

Angles
Anodes
Architectural Shapes
Blanks
Brazing Solder
Burs
Cast Bronze Fittings
Channels
Circles
Commutator Bars
Condenser Head Plates
Condenser Tubes
Continuous Hinge Strips
Copper Tubes for Plumbing, Heating and Gas Lines
Die Castings
Die Pressed Forgings
Drawn Shapes
Electrical Wire and Cable
Electro-Deposited Thin Sheet Copper
Everdur Electrical Conduit
Electrical Metallic Tubing
Rigid Conduit
Extruded Shapes
Fancy Pattern Seamless Tubes
Fancy Pattern Sheet Metal
Forging Blanks
Heat Exchanger Tubes
Ingots
Large Diameter Tubes
Open Seam Tubes
Pipe
Platers' Bars and Cores
Plates
Pressure Die Castings
Printers' Rules
Printing Rollers
Projectile Bands
Rivets
Rods
Rolled Shapes
Rolls
Seamless Tubes
Segments
Sheet Metal Mouldings
Sheets
Shells
Small Diameter Tubes
Strips
Terrazzo Strips
Through-Wall Flashings
Tubes for Dry Cans
Turbine Blading
Welding Rods
Wire

Standard Anaconda Metals are listed on the following page

THE AMERICAN BRASS COMPANY

ANACONDA METALS

Admiralty	Economy Bronze
Ambraloy	Everdur*
Ambrac*	Forging Bronze
Architectural Bronze	Hardware Bronze
Avialite* Bronze	Jewelry Bronze
Benedict Nickel	Manganese Bronze
Beryllium Copper	Muntz Metal
Brass (Red)	Naval Brass
Brass (Yellow)	Nickel Silver
Brazing Metal	Phosphor Bronze
Bushing Bronze	Silicon Copper
Commercial Bronze	Super-Nickel
Copper	Tempaloy*
Cupro Nickel	Tobin Bronze*

Technical Service

No one metal can satisfy every requirement. Wherever metal is used, such problems as corrosion, ductility, conductivity, fatigue, strength and abrasion are encountered, and while copper alloys, in general, can be used to meet these requirements, maximum results can be obtained only by selecting the alloy best suited for a specific purpose. The American Brass Company, having a background of more than a century's metallurgical experience, will gladly co-operate in the solution of individual metal problems.

Base Prices and Schedules of Extras for pricing Anaconda Metals furnished upon request.

*Trade-marks Reg. U. S. Pat. Off.

ANACONDA STANDARD AND SPECIAL PRODUCTS

The American Brass Company through its seven large plants with their specialized equipment, is able to satisfy every manufacturing requirement for a copper or copper alloy material. The strategic locations of the mills in the industrial centers of the country are the focal points for economic distribution of non-ferrous metals to consuming manufacturers.

During the past year, The American Brass Company has produced seamless drawn tubes with openings too small to admit the passage of a human hair, as well as the world's largest condenser head plates, huge Muntz Metal semi-circles 126 inches in radius and weighing 9,300 lbs. each. It produces, as a matter of daily routine, alloys for deep drawing and spinning, wire for weaving and for delicate springs, special alloys for cartridge cases and for watch springs, platers' cores and bars with special properties required by jewelry artisans, sheets and shells for pressure vessels, metals which can be machined and cut at high speeds, but will have high physical properties and corrosion resistance, materials in special designs for decorative purposes, rods for welding by either the gas or electric process.

In addition, The American Brass Company produces special alloys and special forms for the use of customers with unusual requirements. Today its Research Department may create a bronze for a ball cage which may require conflicting properties, such as stiffness and high fatigue limit as well as the ability to undergo severe forming operations and to machine without forming burs. Tomorrow, it may be called upon to evolve a casting alloy which will have high tensile strength, ductility and toughness, with excellent machinability. Through its Research and Technical Department, The American Brass Company is constantly solving current metal problems and anticipating future requirements with the development of new metals to meet them.

The following pages contain brief descriptions of the more representative standard Anaconda products. Literature and additional information on any of these products will be furnished upon request.

ANACONDA CONDENSER TUBES

SUPER-NICKEL, AMBRAC*, AMBRALOY, COPPER, ADMIRALTY AND MUNTZ METAL

Anaconda Super-Nickel and Ambrac Tubes are recommended for marine and stationary condensers operating under unusually severe conditions. Actual experience during the past ten years substantiates the conclusions of metallurgists that high nickel alloys provide the best resistance to wear and corrosion and possess the necessary heat conductivity and strength to meet all condenser requirements.

More than 300 vessels are now equipped with high nickel alloy tubes and numerous installations have been made in land stations.

Ambraloy-927 Tubes have given especially good results in certain quarters and, when the user feels that conditions do not warrant the higher price of Super-Nickel or Ambrac, The American Brass Company offers condenser tubes of this alloy for installations where Admiralty Tubes have failed in service because of impingement attack.

Anaconda Super-Nickel, Ambrac, and Ambraloy Condenser Tubes are now produced by an **extrusion, rolled and drawn process** which makes possible a better finish and physical structure in these alloys than is obtainable by either cup drawn, Mannesman or cast shell methods.

Descriptive literature and prices furnished upon request.

*Trade-marks Reg. U. S. Pat. Off.

ANACONDA
LARGE DIAMETER
SEAMLESS TUBES AND SHELLS

In order to supply the growing demand for large diameter Seamless Tubes, The American Brass Company has enlarged its equipment for Tube manufacture and is now prepared to furnish Copper and Copper Alloy Tubes and Shells up to 26 in. diameter, and in commercial gauges.

TUBES

Among the various applications where large Tubes have proven satisfactory are Paper Rolls for the manufacture of newsprint and other pulp papers, Pulp Lines, Pump Cylinder Tubes for Gasoline Pumps, Dry Cans, Steam Lines, Expansion Joints for Pipe Lines, Refrigerator Condensers or Coolers, Projectile Bands, Marine installations and similar uses.

SHELLS

A specialty is also made of large size Seamless Copper, Brass and Everdur Shells with one end closed.

In the fabrication of the Shells the closed ends are left much heavier than the sides, having practically the original thickness of the metal of the Circles from which they are formed.

Such Shells are used for the manufacture of Tanks, Range Boilers, Sterilizers, Chemical Stills and a great variety of other purposes.

TOOLS

Tools are available for the manufacture of Tubes and Shells in a large variety of sizes up to 26 in. diameter. Where the quantity involved is sufficient to warrant the cost of new tools, special size Tubes or Shells can be made up to the limit mentioned, provided the gauge is not proportionally too heavy nor too light for the diameter.

Further information and prices furnished upon request.

ANACONDA WELDING RODS

For Oxy-Acetylene and Electric Welding

TOBIN BRONZE*, ANACONDA-520 BRONZE, MANGANESE BRONZE, PHOSPHOR BRONZE, EVERDUR*, SUPER-NICKEL, ELECTROLYTIC COPPER, DEOXIDIZED COPPER, ECONOMY BRONZE, BRAZING METAL

The Oxy-Acetylene and Electric Welding Processes have developed so rapidly that the equipment has become standard in foundries, machine shops, garages, locomotive and machine repair shops and for fabricating all kinds of metal equipment, as well as assembling metal structures.

The American Brass Company, one of the first to realize the importance of this great constructive work, has developed, through exhaustive study and research, a complete line of Anaconda Welding Rods in various alloys, each with its individual characteristics and each particularly adapted to a certain class of work.

Uniform composition and tensile strength of the filler rod are essential to the production of strong welds. Both factors have been carefully studied by The American Brass Company and are rigidly controlled throughout the manufacturing process, resulting in uniformly strong, clean, dense rods—free from impurities, dirt spills and other defects.

The American Brass Company offers the services of its technical staff for the discussion of specific welding problems, and is also prepared to furnish welding rods of special composition to meet unusual requirements or recognized engineering specifications.

Descriptive literature and prices furnished upon request.

*Trade-marks Reg. U. S. Pat. Off.

ANACONDA CASTING INGOTS

To provide foundries with casting alloys of uniform composition, The American Brass Company produces ingot metal in seven alloys to meet both engineering and architectural requirements. All Anaconda ingot metal is produced under close metallurgical control to provide exact composition, and is ready for remelting and casting with ordinary brass foundry equipment.

Anaconda casting ingots are furnished in the following alloys and forms:

Benedict Nickel—Cast bars cut into blocks, suitable for charging small crucibles—used chiefly to match wrought Nickel Silver architectural materials.

Ambrac*—20%—In small blocks—used for cast equipment requiring a high strength, high corrosion resistant white material.

Ambrac*—30%—Same form and purposes as Ambrac—20%—possesses higher physical values and corrosion resistance.

Manganese Bronze—In 25-pound notched ingots—used for cast parts requiring resistance to wear and abrasion.

Architectural Metal—In small blocks—used for castings to match the color of wrought architectural bronze materials.

Everdur*-1000—In 25-pound notched ingots—used for engineering equipment castings requiring high strength, high corrosion resistance and weldability.

Tempaloy*—Same form as Everdur. In addition to high strength and unusual resistance to severe corrosion, Tempaloy castings can be heat treated to increase hardness and resistance to abrasion.

Descriptive literature and prices furnished upon request.

*Trade-marks Reg. U. S. Pat. Off.

ANACONDA EXTRUDED AND DRAWN SPECIAL SHAPES

Anaconda Special Shapes, produced by the extrusion or drawing processes, are used to a large extent by leading fabricators of ornamental and structural metal work, as well as manufacturers of machinery and mechanical equipment.

EXTRUDED SHAPES

Copper alloys, which can be hot worked, are successfully wrought into intricate finished shapes by extruding through a hardened steel die. Extruded Shapes are characterized by their strong, homogeneous structure, smooth surface and freedom from pits and porosity found in castings. The edges are sharp, and clean, making possible the detailed execution of original designs.

Extruded Shapes are used not only for architectural purposes, but many manufacturers have increased the quality and decreased cost of their products by using these preformed shapes in place of castings or other materials which required considerable machining.

DRAWN SHAPES

Anaconda Drawn Shapes are produced by cold drawing and are available in a wider range of alloys and lighter sections than Extruded Shapes. The physical values of Drawn Shapes are somewhat higher than shapes which are extruded. They are used for essentially the same purposes, the alloy usually being the determining factor.

DIES

The American Brass Company has accumulated thousands of dies for both Extruded and Drawn Shapes, thus saving tool costs in many instances.

Descriptive literature and prices furnished upon request.

ANACONDA
DIE PRESSED METALS

The continued demand from users of small parts made from sand castings for a better product, free from blowholes and other defects common in castings, has been met by The American Brass Company through the manufacture of hot forged or pressed parts.

To insure the greatest possible density and also the absence of both exterior and interior imperfections, extruded rods are used as the base product, thereby retaining all the good qualities of that material in the pressed parts which are nearly twice as strong as sand castings. They are gas, air and water-tight and will withstand high pressures.

Die Pressed Parts have the advantage of being more uniform in shape and truer to size than sand castings. In most instances, the machining of die pressed parts is unnecessary except for sizing of close fitting parts. Because of their uniform size, die pressed parts can be chucked with little, if any fitting. They machine and thread easily and can be finished at relatively high speeds.

Descriptive literature and prices furnished upon request.

ANACONDA PRESSURE DIE CASTINGS

Because Die Castings have smooth surfaces, uniformity of shape, accurate dimensions and are free from blowholes, they can be used with little, if any, finishing.

Anaconda Pressure Die Castings, which can be cored when necessary, are produced on machines which differ in many ways from the equipment in general use; principally in higher operating pressures which have a marked effect in improving the density as well as the surface of the cast metal.

Pressure Die Castings of exceptional strength are available in a copper rich alloy containing small percentages of silicon and manganese. This metal known as Everdur-1026 is protected by patents owned by The American Brass Company. It has a minimum tensile strength of 85,000 pounds per square inch and a minimum elongation of 8% in 2 inches.

Where a softer metal than brass will meet requirements, zinc alloy castings can be produced which will be stable in warm, humid atmospheres.

Descriptive literature and prices furnished upon request.

ANACONDA RIVETS AND BURS

COPPER, BRASS, BRONZE, EVERDUR* AND NICKEL SILVER

Anaconda Rivets and Burs are accurate to size, uniform in temper and of high purity.

They are manufactured by carefully supervised processes and are packed in attractive boxes, each containing the full specified net weight.

Standard Flat Head Rivets are stamped with the Anaconda Spear Head and all packages are labeled with the Anaconda Trade-mark, a guarantee of quality and dependability.

Flat Head Copper Hose Rivets

Packed with and without burs. Nos. 7 and 8, all lengths from ¼ in. to 1 in.

Oval Head Copper Trunk Rivets

Packed with and without burs. No. 9, all lengths from ¼ in. to 1¾ in. No. 12, all lengths from ¼ in. to ¾ in.

Copper Brake Band Rivets, Countersunk Head

Sizes: Nos. 6 (.203) to 12 (.109), ⅜ in. to 1 in. long over all. Packed in 1 lb. boxes or in bulk weights of 25 lbs. or over.

Copper Belt Rivets

Packed with and without burs. Nos. 4 to 15, all lengths from ¼ in. to 2 in.

Copper Burs Only

No. 3, 59/64 in. outside diameter; .290 in. inside diameter; .081 in. thick; and intermediate sizes to No. 16, ¼ in. outside diameter; .067 in. inside diameter; .018 in. thick.

Packing

All the above styles and sizes are supplied in bulk or in boxes containing 8 oz., 12 oz., 1 lb., 4 lbs., or in any other size box to meet customers' requirements.

Standard size Rivets and Burs packed in boxes of uniform or assorted sizes carried in stock for prompt shipment.

Descriptive literature and prices furnished upon request.

*Trade-mark Reg. U. S. Pat. Off.

ANACONDA RIVETS AND BURS

COPPER, BRASS, BRONZE, EVERDUR* AND NICKEL SILVER

Unless otherwise specified all rivets in cartons are shipped in cases containing 100 lbs.

Oval Head Copper Braziers' Rivets

Length measured from under the head

Sizes: From No. 00, 5/32 in. shank and 5/16 in. long to No. 10, 21/32 in. shank and 1 1/4 in. long.

Flat Head Copper Braziers' Rivets

Length measured from under the head

Sizes: From 1/4 in. to 1/2 in. diameter of shank and from 1/2 in. to 2 in. in length.

Both Oval and Flat Head Braziers' Rivets are packed in boxes containing 5 lbs., or in bulk cases containing 100 lbs.

Flat Head Copper and Brass Tinners' Rivets

Sizes: 1/2 lb., 3/4 lb., 1lb., 1 1/4 lbs., 1 1/2 lbs., 2 lbs., 2 1/2 lbs., 3 lbs., 4 lbs. to 6 lbs., to the thousand, packed 1,000 rivets of uniform length per box.

Oval Head Brass Jacket Rivets

Length measured from under the head

Sizes: Nos. 7, 8, 9 and 12, 1/4 in. long. Nos. 8 and 13, 3/16 in. long. Uniform lengths packed in 1 lb. boxes.

Copper or Brass Washers

Supplied in packages or bulk to fit 3/16 in. to 1 in. bolts, inclusive.

Special Copper or Brass Rivets

Tools are maintained for producing Round, Oval, Countersunk and Cone Head Rivets in diameters of 1/8 in. to and including 3/4 in., and lengths of 3/16 in. to and including 4 in., depending on the size of the shank.

A minimum quantity of 25 lbs. is required when filling orders for Special Rivets.

Descriptive literature and prices furnished upon request.

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* Trade-mark Reg. U. S. Pat. Off.

ANACONDA ELECTRICAL WIRE AND CABLE

Anaconda Electrical Wire and Cable, manufactured by The American Brass Company, is sold by the Anaconda Wire & Cable Company, 25 Broadway, New York.

Anaconda engineers have contributed many important developments to the electrical industry, not only in the metallurgy of materials but in the design of wires and cables.

It was discovered in the laboratories of The American Brass Company that the element Cadmium could be readily alloyed with Copper to produce bronzes with strength, resistance to wear, and electrical conductivity greater than the Tin-Bronzes previously used. The Cadmium-Bronzes are sold under the trade name Hitenso*.

Calsun Bronze*, a patented alloy of copper, aluminum and tin, is another Anaconda material, developed to supply the need for a non-ferrous metal of high strength to be used for overhead construction, guy and messenger cables, overhead grounds and other applications where unusual structural strength is essential.

Bare Copper Wire and Cable—is made from Anaconda mined and electrolytically refined copper having a purity of not less than 99.9%. Both products conform with every requirement of the American Society for Testing Materials specifications.

Hollow Conductors (Patented)—have been developed to obtain the desired outside diameter in the most efficient manner, eliminating the use of non-conducting steel, hemp or jute materials for fillers.

Anaconda Hollow Conductors are sturdy and economical, and consist of a core made by twisting a copper strip of I-Beam cross section around its longitudinal axis upon which are stranded the wires of the cable either single or in rope lay construction. The web of the core provides a rigid column across the diameter of the cable and the flanges give adequate bearing surface for the wires at short intervals, resulting in a light weight, flexible, cylindrical cable capable of withstanding high compression.

Anaconda Hollow Conductor is efficient and economical for transmission of voltages of 220,000 and above, or of large currents. The large outside diameter effectively reduces corona and a-c. resistance losses, practically eliminating skin effect, and has a higher current-carrying capacity because of its larger surface for radiation of heat.

Descriptive literature and prices furnished upon request.

*Trade-marks Reg. U. S. Pat. Off.

ANACONDA ELECTRICAL WIRE AND CABLE

Anaconda Electrical Wire and Cable, manufactured by The American Brass Company, is sold by the Anaconda Wire & Cable Company, 25 Broadway, New York.

Hitenso* "BB" Transmission Wire—A high strength, high conductivity wire for long spans. Developed to meet service requiring great strength with the least possible sacrifice of conductivity.

This wire has a minimum conductivity equal to 85% of hard-drawn copper and 35% greater strength. It is 47% stronger than hard-drawn copper of equivalent conductance. Hitenso "BB" permits the use of small diameters on long spans with consequent reduction of wind and sleet load.

Preformed High Strength Cable—A stranded copper-alloy cable especially suitable for cutting into short lengths. Cuts without unraveling. Serving is not necessary. Used for guying poles, aerial messenger cables and cross-span wires or wherever high resistance to corrosion is required of a high strength cable.

Composite Cable—Consisting of a core of Calsun Bronze* wires surrounded by one or more layers of hard-drawn copper wires, combining into one non-ferrous cable both high strength and high conductivity.

Anaconda Hard Drawn Copper Trolley Wires—Are most economical for normal service conditions where traffic is not heavy. Anaconda Copper Trolley Wire is made from Anaconda mined and refined electrolytic copper and fulfills in every respect the specifications issued by the American Society for Testing Materials and the American Electric Railway Association.

Anaconda Tin Bronze Trolley Wires—Designated "High Strength" and "Medium Strength" are manufactured to meet A.S.T.M. and A.E.R.A. specifications.

Hitenso* Trolley Wires—An exclusive Anaconda product, combining high tensile strength with the least sacrifice in conductivity and the maximum service that can be expected from overhead contact wires.

Other Products—In addition to the above products, manufactured by The American Brass Company, a wide variety of insulated, lead sheathed and otherwise protected wires and cables, is manufactured by the Anaconda Wire & Cable Company.

Descriptive literature and prices furnished upon request.

*Trade-marks Reg. U. S. Pat. Off.

ANACONDA
BUS MATERIALS

In addition to a complete line of Copper Bus Bars which are unsurpassed for uniform quality and high conductivity, The American Brass Company produces bus tubes made from specially refined high purity copper billets. These tubes are used for certain installations in place of rectangular copper.

Red Brass Tubes are manufactured for the outside casings of copper bus tube installations surrounded by a dielectric bath of oil. Everdur is supplied for castings and for the bolts which make up the armor clad portion of such bus systems.

The American Brass Company also controls the exclusive rights for constructing hollow ventilated busses from copper rectangular bars, channels or angle shapes, in accordance with the Le Clair Patents together with the sole rights for assembling such copper busses with clamps and supports under the terms and claims of the Bostwick Patent, which rights are available to purchasers of Anaconda Bus Shapes.

Hollow ventilated bus construction provides a solution to many electrical engineering requirements where high voltage, heavy currents and limited space necessitate construction embodying structural strength, and providing low ohmic and reactance loss, and effective heat dissipation. Alternating currents of 2,000 amperes and more are economically carried by hollow busses made of two channel or angle shapes, mounted in rectangular form. Channels are most commonly assembled in pairs placed with webs vertical and sufficiently separated from each other to permit free circulation of air throughout the interior.

Descriptive literature and prices furnished upon request.

ANACONDA
ELECTRICAL CONDUIT

Non-Rusting

Everdur EMT—for use with threadless fittings
Everdur RC—for use with threaded fittings

Everdur Electrical Conduit was developed by The American Brass Company to meet a long felt need for a more durable conduit which would not rust to destruction when in contact with such corroding influences as moisture, dampness, chemicals, etc., prevalent in surrounding air, soil or construction materials.

Everdur Conduit is particularly suitable for public buildings; also for wiring installations in railroad yards and terminals where the conduit might be exposed to smoke fumes; around docks and on shipboard where the action of salt atmosphere is a consideration; in chemical and oil refinery plants; battery rooms; dairies and ice cream plants; subways, mines and underground workings; for viaduct and bridge construction, and other locations where rustable conduit would have a limited life.

Everdur Conduit has been fully tested for conductivity, short circuit and ground, resistance to arcing, electrical bonding, tensile and compressive strength and resistance to impact. Everdur is an alloy composed almost entirely of copper, with small amounts of other materials added to provide great strength and toughness. The advance in price over steel is nominal considering its durability.

Everdur Conduit is trade-marked and both Everdur Electrical Metallic Tubing and Everdur Rigid Conduit are listed and labeled by the Underwriters' Laboratories and have successfully withstood the prescribed tests. EMT and Rigid Conduit are accurately drawn to size for use with standard Everdur fittings now available.

Everdur Conduit is distributed through Electrical Wholesale Supply Houses and Jobbers.

Descriptive literature and prices furnished upon request.

ANACONDA
FANCY PATTERN SHEET METAL

Sheet metal embossed in a variety of standard and ornamental patterns has become a popular product with manufacturers of decorative metal articles.

Former production methods required the embossing of figured ornamentation upon each individual piece after it had been formed, and consequently articles of this character were quite expensive.

To overcome such high production costs, The American Brass Company developed facilities for supplying the basic metal already embossed in a variety of standard patterns and designs. This figured sheet brass, which can be obtained in strips and coils showing a wide variety of patterns, is economically used in the manufacture of jewelry findings, dress trimmings, table-ware, lighting fixtures, house furnishings, toilet accessories, etc.

These embossed patterns can be applied to Copper, Yellow Brass, Red Brass, Commercial Bronze and some grades of Nickel Silver. Special designs can be made to order, provided the quantities required are sufficiently large to warrant the expense of new embossing rolls.

Catalog of standard patterns and price information furnished upon request.

ANACONDA
FANCY PATTERN SEAMLESS TUBES

Anaconda Fancy Pattern Seamless Brass Tubes have been developed by The American Brass Company in a wide variety of designs, shapes and sizes to supply the demand among the metal arts and crafts for ornamental brasses.

Manufacturers of bridge, floor and table lamps, electric lighting fixtures, metal novelties, andirons, coffin hardware, brass bedsteads and similar furnishings use Fancy Pattern Brass Tubes in the fabrication of their products because they provide an economical means of obtaining artistic results.

Through their use, the expense of making and maintaining embossing dies in addition to many manufacturing operations employed in the production of artmetal designs may be eliminated.

All standard brass finishes may be applied to Fancy Pattern Tubes and many unique effects can be produced by combining different designs and shapes.

Catalog of standard patterns and price information furnished upon request.

ANACONDA "ELECTRO-SHEET" COPPER

A recent development by Anaconda metallurgists—the electro-deposition of solid copper—has resulted in the production of copper sheets in very thin gauges, wide widths and practically unlimited lengths, at moderate cost.

"Electro-Sheet" is available in weights of one ounce (.0013 in.) to seven ounces (.0094 in.) per square foot; 1 oz. and 1½ oz. material is furnished in standard widths of 30 in. and 50 in. and 2 oz. to 7 oz. material in standard widths of 30 in. and 40 in., in rolls of unlimited lengths. All the above weights are stocked in Standard Rolls, 30 in. wide, containing 25 ft., 50 ft. and 100 ft. lengths.

A remarkable new development in the form of **Built-Up Copper and Asphalt roofs** has been attained through the use of 2 oz. "Electro-Sheet," 30 in. wide. Outstanding advantages for such roofs are ease of application, smooth appearance and superior durability.

"Electro-Sheet" is also suitable for various other uses including weather-proofing and damp-proofing masonry foundations and cellars, floors, walls and roofs in building construction; termite and vermin proofing wood structures; coverings for walls and ceilings; pipe wrapping; capping wooden piling and power line poles; waterproofing bridge decks; also electrical equipment; shipping containers; novelty stationery and advertising inserts and displays.

"Electro-Sheet" can be bonded readily to canvas, felt, burlap, insulating board, wood, paper, etc., suggesting many practical and useful combinations.

Several of these products have been developed by customers and are now on the market.

Descriptive literature and prices furnished upon request.

ANACONDA
10 OZ. ECONOMY COTTAGE ROOFING

To provide an economical and durable copper roof for small dwellings The American Brass Company has developed Anaconda 10 oz. Economy Cottage Roofing. This product is not intended to compete with the regular 16 oz. copper for general roofing, but to provide a metal roof for the smaller house at a reasonable cost.

Anaconda 10 oz. Economy Cottage Roofing is supplied in the form of strips 16 in. wide by 6 ft. long. By using sheets this width, thus reducing the seam spacing to a scale proportional to the size of a smaller building, thinner metal can be used and still retain the same strength and wind resistance obtained from wider panels of heavier gauge sheets. When these roofing sheets are assembled on the building, the standing seams will be spaced approximately 13 in. apart providing a vertical lined roof of pleasing architectural appearance.

Of all forms of copper roofing, the standing seam type is considered to be the least expensive and provides the greatest freedom from trouble. Such a roof can easily be fabricated by any experienced sheet metal worker and applied practically without solder (except at the flashings) to give free movement for expansion and contraction of the metal and complete protection against the weather.

Anaconda 10 oz. Economy Cottage Roofing strips can be more easily and quickly formed in the shop or on the job than 16 oz. copper. After the panels are formed, they can be installed with regular roofers' tools.

Being made of metal a copper roof reduces the insurance rate as it eliminates the risk of fire from sparks. If a copper roof is correctly grounded, it constitutes one of the most effective forms of protection against lightning.

Copper, more than any other building material, increases in beauty with age and service. Copper roofing reflects quality and aids appreciably in the resale of a house. From an economic standpoint, a standing seam roof requires a minimum of maintenance and should give effective protection against the weather as long as the building stands.

Descriptive literature and prices furnished upon request.

ANACONDA
BRASS AND COPPER PIPE

For use with Threaded Fittings

The American Brass Company manufactures brass and copper pipe in all standard sizes up to and including 10 in. with extra heavy wall thicknesses, and up to and including 12 in. with regular wall thicknesses.

Anaconda Brass Pipe is manufactured in two alloys to meet all water conditions.

Anaconda 67* Brass Pipe can be depended upon to give lasting service in all localities where normal conditions prevail; that is, where the water has a low permanent hardness, a fair degree of temporary hardness or is low in carbonic acid gas content and relatively high in alkalinity. This alloy contains 67% copper, is semi-annealed, seamless and conforms with Government specifications for Grade "B" water pipe.

Anaconda 85* Red Brass Pipe is offered as the highest quality corrosion resistant water pipe obtainable at moderate cost. It is recommended for use under such highly corrosive conditions as are imposed by mechanically filtered waters which are relatively low in hardness, high in carbonic acid gas content and low in alkalinity; ground waters from shallow artesian wells or large dug wells and colored water from peaty sources. This pipe is also recommended for rigid underground lines and salt water service. Anaconda 85 Red Brass Pipe contains 85% copper, is semi-annealed, seamless and conforms with Government specifications for Grade "A" water pipe.

Anaconda Copper Pipe is available for those who prefer to use pure copper pipe to meet highly corrosive water conditions. It is of the same high quality that characterizes Anaconda Brass Pipe.

Descriptive literature and prices furnished upon request.

*Trade-marks Reg. U. S. Pat. Off.

ANACONDA
COPPER WATER TUBES

For Plumbing, Heating and Gas Lines

The American Brass Company offers Anaconda Copper Water Tubes for underground service and also for interior plumbing where low cost is the influencing factor.

Within comparatively recent years, copper tubes have been used with entire success for underground water service lines, suction and return lines connecting oil burners with fuel tanks, fire and lawn sprinkler systems, domestic gas lines, low pressure heating lines, air conditioning and industrial and residential plumbing.

Anaconda Copper Water Tubes are furnished both hard and soft and in two classes as to wall thickness.

Type K, the heavier tube, complies with U. S. Government Specification WW-T-799 or A.S.T.M. Specification B-88-33 for Type K tubes. This class of tubes is recommended for underground service and general plumbing.

Type L tubes meet the requirements of the same government specifications for Type L tubes and are suitable for interior plumbing.

All Anaconda Copper Water Tubes are drawn to the accurate dimensions required for use with standard solder or flared tube fittings and conform with **U. S. Government and A.S.T.M. Specifications.**

As a safeguard against substitution and to afford permanent identification, the name ANACONDA is stamped in the metal at intervals throughout each straight length and coil of Copper Water Tube.

Descriptive literature and prices furnished upon request.

ANACONDA FITTINGS

CAST BRONZE AND WROUGHT COPPER

For Assembling Anaconda Copper Water Tubes

The American Brass Company offers a complete line of Anaconda Fittings of three distinct types for assembling Copper Water Tubes:

(a) Cast Bronze Flared Tube Fittings, in all sizes from ⅛ in. to and including 2 in.

(b) Cast Bronze Solder Fittings, in all sizes from ¼ in. to 6 in. inclusive.

(c) Wrought Copper Solder Fittings, in all sizes from ⅜ in. to 2 in. inclusive, including Seamless Tees.

Anaconda fittings are precision-made to assure tight connections and an unrestricted flow. For permanent identification, the Anaconda trade-mark is cast or stamped in every fitting.

Anaconda Flared Tube Fittings in conjunction with soft Anaconda Copper Water Tubes, have a definite field of application, particularly for fire sprinkler systems and underground lines such as water and domestic gas services, oil burner assembly and supply lines, etc.

Anaconda Cast Bronze Solder Fittings make it possible to assemble Copper Water Tubes with sound, leak-proof joints for water, gas and oil lines; also low pressure steam and air installations. All standard reductions and standard pipe threads are provided for in Anaconda Cast Bronze Solder Fittings.

Anaconda Wrought Copper Solder Fittings possess high tensile strength with complete elimination of porosity which makes them particularly suitable for lines carrying refrigerants such as Freon, Sulphur Dioxide, Methyl Chloride, and other penetrating fluids and certain thin gases. The wrought fittings heat at the same rate as the copper tube, making perfect solder connections which are stronger than the tube itself. Through the use of adapters, all combinations of connections are possible with these fittings.

Accessories

For the convenience of users of Anaconda Copper Water Tubes and Fittings, The American Brass Company is prepared to furnish spooled solder wire (95% tin—5% antimony); "Nokorode" soldering paste; Anaconda copper tube straps and Anaconda sizing and flanging tools.

Descriptive literature and prices furnished upon request

ANACONDA THROUGH-WALL FLASHINGS

Anaconda Through-Wall Flashings are made of 16 ounce Anaconda Copper, either plain or lead coated, in strips five feet long, with a zigzag pattern of ridges embossed in two widths for either 8 in. or 12 in. walls. These ridges, which prevent lateral movement are 7/32 in. high and so designed that water which accumulates in the wall will be shed outwardly or in the desired direction.

Anaconda Flashings are supplied in three Standard Types and in Special Forms as follows: Type A is for use where a flashing flush with the faces of the wall is desired. Type B has a plain 4 1/4 in. selvage on the drain side of the flashing. Type C for Spandrel and Lintel flashing, has a 2 in. selvage on the dam side, and is made for a 12 in. wall only.

Special Anaconda Through-Wall Flashings are made to order with a variable selvage up to 4 in. on the dam side, and with a variable selvage on the drain side up to an over all flashing width of 25 in.

Through the planned efficiency of design and the variety of sizes and shapes available, Anaconda Flashings supply a definite need for a product that can be used on the less expensive class of buildings. The patented design provides for an effective bond with the mortar and offers resistance to lateral movements of the wall which may be caused by vibration, ice, a sloping bed or slime produced by lime in the mortar.

An advantage to the sheet metal worker and to the mason lies in the simplicity of the design and the ease of application. Anaconda Flashings can be bent and cut to fit on the job by the contractor. Tight end joints can be made by overlapping one corrugation. Interior and exterior angles at corners may be flashed by butting or slightly lapping the adjoining sheets. Where specified, solder is easily applied to the flat ends or edges of the flashing. Another practical advantage of this flashing is that the strips nest together so that, when carried in stock they occupy very little more space than plain sheets. This feature also facilitates transportation and handling.

Descriptive literature and prices furnished upon request.

EVERDUR*

Strong as Steel; Durable as Copper

Everdur is Copper scientifically alloyed with Silicon and other elements to make it as strong as steel. The standard Everdur alloy possesses the strength and toughness of medium carbon steel and resistance to a somewhat wider range of corroding agents than copper. It is readily weldable by both gas and electric methods, and for other fabricating operations is worked by substantially the same methods and equipment used with steel.

In addition to the standard wrought Everdur, there are a number of modified alloys, one of which has free-cutting qualities.

As an engineering and structural material, its balanced combination of physical, chemical and fabricating properties, have made it possible for Everdur to replace other materials, not only with initial economy, but providing more efficient service and longer life.

Among its many applications are hot water tanks, chemical process vessels, brew kettles, air conditioning equipment, sewage disposal and waterworks equipment, boat fastenings, circuit breaker domes, pump shafting, cast valves and fittings, acid sludge lines, heat exchanger equipment, cable clips and pole line hardware, etc.

Everdur is produced exclusively by The American Brass Company in the forms of plates, sheets, wire, rods, pipe and tube, hot pressed parts, forging blanks, casting ingots and welding rods. It is available in fabricated form from experienced manufacturers.

Descriptive literature and prices furnished upon request.

*Trade-mark Reg. U. S. Pat. Off.

BERYLLIUM COPPER

This recently developed Anaconda metal is pure Copper alloyed with Beryllium and Nickel. Because it readily responds to precipitation hardening, Beryllium Copper can be cold worked and heat treated to obtain higher physical values than those of any other non-ferrous metal.

The most valuable feature of this alloy is that it can be worked and formed in the soft annealed state, and its physical properties afterwards greatly increased by heat treatment. Soft annealed alloy with a tensile strength of about 70,000 p.s.i. can be improved by cold working and heat treatment to any desired strength up to 200,000 p.s.i., with Rockwell of C-41, or G-104 hardness, Brinell of 360 or more, and a fatigue limit well above 40,000 p.s.i. These properties remain stable at ordinary temperatures.

The fatigue resistance of Beryllium Copper has been demonstrated in an extensive vibration test. The sample tested was $1\frac{5}{8}$ in. long, .013 in. thick, $\frac{3}{8}$ in. wide at one end, tapering to $\frac{3}{16}$ in. at the other. The vibrator was operated at a rate of 230 cycles per second, the full movement of the deflection being $\frac{1}{16}$ in. Each reversal involved a stress of 20,000 pounds. After two billion reversals, no signs of fracture due to fatigue were present.

The electrical conductivity of Beryllium Copper is high compared with that of steel, phosphor bronze and other high-strength materials. Both electrical and thermal conductivities of Beryllium Copper are improved by heat treatment.

Beryllium Copper is produced by The American Brass Company in the forms of sheets, wire, rods, tubes, and within certain limitations, die pressed parts.

Descriptive literature and prices furnished upon request.

AMBRAC*

Ambrac is the trade name of a corrosion resisting white metal introduced and manufactured exclusively by The American Brass Company.

Because of its ability to withstand the action of alkalis, hot gases, dilute acids and saline solutions, it has been used with exceptional success for mine screens, salt works tubes and condenser tubes. It is suitable for engineering purposes where high resistance to corrosion and maximum strength combined with easy working qualities are desired.

Unlike many alloys exploited for similar purposes, it is not refractory but can be drawn, spun, stamped or double seamed with ease.

When annealed, Ambrac has a tensile strength of approximately 50,000 pounds per square inch and an elongation of about 35% in two inches. This tensile strength can be increased to 110,000 pounds per square inch, or even higher by cold working. The elongation would be correspondingly reduced to about 1.5% in two inches.

Ambrac is supplied in wrought forms and casting ingots.

AMBRALOY

Ambraloy is used generically to define all Aluminum Brass and Aluminum Bronze Alloys manufactured by The American Brass Company. These include both standard and special alloys produced in various forms, a number of which respond to precipitation hardening or heat treatment. Ambraloy is used extensively for condenser tubes, where it meets the requirements in price and service durability of an intermediate grade between Admiralty and the Nickel Alloys.

Avialite* another Aluminum Bronze Alloy is designed especially for use in the aviation field as a valve seat material. Through its physical properties, it closely responds to the coefficient of expansion of Aluminum Alloy cylinder heads. It will withstand long and fast flights without being affected by the hammering or "peening" of the valves and does not become pitted from carbon as do iron and steel.

Descriptive literature and prices furnished upon request.

*Trade-mark Reg. U. S. Pat. Off.

OTHER ANACONDA PRODUCTS

WIRE FOR WEAVING INTO CLOTH

Copper, Fourdrinier, Phosphor Bronze, Ambrac,* Antique and Golden Bronze.

SPECIAL WIRE PRODUCTS

Brake Lining Wire. Preformed wire for well screen construction. Fancy Shaped Wire in a variety of designs. Nickel Silver Resistance Wire. Fine wire on spools.

NICKEL SILVER

For flatware, spoon, knife and fork handle stock. Key stock, knife bolster stock. Slide fastener stock.

SHEET AND PLATE PRODUCTS

Mine Screen Plates. Cold Rolled Phosphor Bronze Bridge Plates. Rolled plates for Perforated Grilles. Polished and Patent Leveled Sheets. Engravers. and Etching Brass. Printers' Rules.

TURBINE BLADING, CAULKING AND PACKING STRIPS

Copper, "70 & 30" Brass, Manganese Copper, Cupro Nickel-20%, Monel Metal, Pure Nickel and Stainless Iron.

PLATERS' BARS AND CORES
COPPER AND CUPRO NICKEL PROJECTILE BANDS

Further information and prices furnished upon request.

*Trade-mark Reg. U. S. Pat. Off.

"HOLTITE"* BRAZING SOLDER

Twenty-five years' experience in producing Brazing Solder has developed a wide range of alloys which are carefully granulated to meet any specification as to size required for various uses, including the manufacture of the following: Automobiles, Bicycles and Motorcycles, Brass and Steel Buttons, Sugar Apparatus and Acid Stills, Copper Work for Marine purposes, Jewelry and small Metal Wares, Brazed Brass and Steel Tubes.

LIST OF STANDARD GRADES

Giving Numbers, Grains, Sizes, Colors and Melting Temperatures.

Brazing Solder Number	Grain	Size	Color	Melting Point °C.	°F.
40	Round	Extra Fine	Yellow	882	1620
41	"	Fine	"	"	"
42	"	Med. Fine	"	"	"
43	"	Med. Coarse	"	"	"
44	"	Coarse	"	"	"
45	"	Extra Coarse	"	"	"
51	"	Fine	"	"	"
52	"	Med. Fine	"	"	"
61	"	Fine	Gray	813	1495
62	"	Med. Fine	"	"	"
91	"	Fine	"	868	1595
92	"	Med. Fine	"	"	"
100	Long	Extra Fine	Yellow	882	1620
101	"	Fine	"	"	"
103	"	Med. Fine	"	"	"
105	"	Coarse	"	"	"
106	"	Extra Coarse	"	"	"
500	Lump		"	"	"
520	"		"	"	"
1200	Long	Coarse	"	"	"
1407	Round	Fine to Med. Coarse Mixed	"	"	"
Black Button	"	Fine	Black	782	1440

Packed in cans holding 10, 25 and 50 lbs. each, also furnished in bulk, 100 or 200 lbs. to the case.

Descriptive literature and prices furnished upon request.

*Trade-mark Reg. U. S. Pat. Off.

ANACONDA METALS FOR BOATS

Tobin Bronze* propeller shafting was used in the original naphtha launch built by Gas and Engine Power Co. in 1885. Since that date Tobin Bronze and other Anaconda metals have been standard materials in the construction of motor boats, yachts and sailing craft. Today the great majority of standard motor boats and cruisers are equipped with either Tobin Bronze or Tempaloy shafts and are fastened with Everdur Metal. All America's Cup Defenders, with one exception, from "Vigilant" (1893) to "Rainbow," 1934 defender, have had Tobin Bronze hulls. "Miss America IX" and "Miss America X," are fastened with Everdur screws.

Combining high resistance to salt water corrosion with light weight, ductility and tortional strength comparable to steel, Tobin Bronze is an ideal metal for marine duty. In addition to hull plates and propeller shafting, Tobin Bronze is used for fin keels, centerboards, rudders, skegs and other underwater parts.

Tempaloy* is a new high-strength, heat-treatable copper alloy, which is furnished in the form of shafting for high-speed and heavy duty boats where maximum strength and toughness as well as light weight are essential.

Everdur* has become the most widely used fastening material for boats. It is also used for welded gasoline tanks, bulkheads and underwater parts.

Ambrac*—Cast and wrought hardware.

Nickel Silver—Cut-waters, mouldings, hardware, etc.

Brass and Bronze—Hardware, trim, cables, etc.

Copper and 85 Red Brass Pipe—For plumbing and exhaust pipes.

Copper Water Tubes and Fittings—For plumbing and fuel lines.

Special Extruded and Drawn Shapes—For mouldings, trim, sail tracks, bindings, etc.

Descriptive literature and prices furnished upon request.

*Trade-marks Reg. U. S. Pat. Off.

ANACONDA METALS FOR TEXTILE MILLS

For years Anaconda Metals have been serving economically and efficiently as textile equipment materials. Anaconda engineers have solved many problems and developed many standard Anaconda materials which are used for textile mill service, including the following:

Copper Printing Rollers

Furnished in three types—Solid, Duplex and Built-Up. Anaconda Rollers are accurate in dimension, uniform in hardness and meet all requirements for machining, burnishing, polishing, pantagraphing and etching. They are particularly free from porosity. All rolls are fabricated from Anaconda High Conductivity Copper.

The Duplex and Built-Up types are exclusive Anaconda developments. They combine the efficiency of solid rolls with considerable savings in weight and cost.

Seamless Copper and Everdur Tubes for Dry Cans

These tubes, which are free from brazed seams, are produced by cold drawing through dies, which provides exceptionally high strength, stiffness and smoothness of surface. They are round and straight, and are furnished in special diameters for dry can service.

Everdur*

Everdur Metal is copper alloyed with other elements to obtain the strength and weldability of steel. It is immune to rust and highly resistant to a wide variety of corroding agents.

Leading manufacturers of textile equipment can furnish welded tanks, vats, kettles, buckets, dippers, extractor baskets, bleaching and dyeing equipment, hoods, kiers, cast valves, fittings, linings, etc., made of Everdur.

Further information and prices furnished upon request.

*Trade-mark Reg. U. S. Pat. Off.

ANACONDA METALS FOR TEXTILE MILLS

Ambrac*

Ambrac is a high strength, corrosion resistant alloy composed principally of copper and nickel. It is available in both cast and wrought forms for textile equipment. Unlike most high strength white metal alloys, Ambrac is not refractory and is worked almost as easily as brass.

Brass Pipe and Copper Water Tubes

Anaconda Seamless Brass Pipe for use with threaded fittings is made in two alloys,—67 Yellow Brass Pipe for use under normal corrosion conditions, and 85 Red Brass Pipe, which is considered the most durable brass pipe produced commercially.

Anaconda Copper Water Tubes are used extensively for plumbing and carrying lines. Anaconda Fittings, for assembling the tubes, are furnished in both solder and flared tube types.

Other Products

Anaconda Copper, Brass, Bronze and Special Copper Alloys in the forms of sheets, wire, rods and seamless tubes are in service in multiple applications in textile mills, such as linings for tubes and size boxes, copper covered squeeze rolls, miscellaneous rollers, facings for rotary press beds, spirals for cloth openers, traveler rings, humidifying equipment, loom and spinning equipment, bushings and bearings, spreader bars, hydro-extractor baskets, pails, dippers, etc.

Anaconda Die Pressed Parts, Pressure Die Castings, Extruded, Drawn and Rolled Special Shapes and irregularly formed Seamless Tubes are used to improve quality and effect economies in the design and construction of textile machinery.

Further information and prices furnished upon request.

*Trade-mark Reg. U. S. Pat. Off.

ANACONDA PRODUCTS FOR PULP AND PAPER MILLS

For years Anaconda Copper and Copper Alloys have been used to solve corrosion and mechanical problems in pulp and paper mills; in many instances through the development of special metals to provide combinations of qualities not obtainable in standard materials.

Among the special Anaconda Products and Metals used extensively in the pulp and paper industries are:

Phosphor Bronze and special alloy wire for weaving into Fourdrinier screens.

Yellow Brass and Red Brass Tubes specially fabricated for Fourdrinier rolls.

Phosphor Bronze and other special alloy Jordan and Beater Bars.

Copper, Brass and Everdur for "Save-All" pans.

Copper Alloy Welding Rods for gas and electric welding.

Large diameter, cold drawn, Seamless Copper Tubes for conveying "white water" and pulp.

Everdur is used in a wide variety of applications where high strength and high corrosion resistance are required of a material that is as flexible as steel from a structural standpoint. Everdur "Save-All" pans, fabricated by welding, have replaced pans made from other materials, not only with initial economy, but with service life several times that of the pans replaced.

Anaconda Brass Pipe for use with threaded fittings, is manufactured in two alloys—67 Yellow Brass for use under normally corrosive conditions, and 85 Red Brass, considered the most durable brass pipe available.

Anaconda Copper Water Tubes are furnished in both straight lengths and coils for use with Anaconda solder or flared type fittings.

Special Products

Anaconda Die Pressed Forgings, Pressure Die Castings, Special Extruded and Drawn Shapes, and irregularly formed Seamless Tubes are used to replace sand castings for many paper mill machinery parts. They are free from blow holes or other imperfections, have a higher tensile strength and require very little, if any, machining.

Further information and prices furnished upon request.

FRENCH SMALL TUBE BRANCH

The French Small Tube Branch, as manufacturers of a completely diversified selection of small diameter and thin gauge Copper, Brass, Bronze, Nickel Silver and Aluminum Tubes, occupies a most unique position in its own field. Its products are used by innumerable industries and professions and range from commercial sizes used in connection with the equipment of automobiles, refrigerators and oil burners to minute special shapes used in assembling intricate surgical instruments and delicate recording equipment.

Standard manufacturing limitations for French tubes are from 1 in. O.D. to fifteen one-thousandths of an inch O.D. and a five-thousandths of an inch hole. French Tubes are produced not only in cylindrical form, but also in square, rectangular, hexagonal, fluted and other special and irregular cross sections. One of the specialties of this branch is Bourdon Tube, in all wall thicknesses down to .003 inch.

Through the development of a new process, the French Small Tube Branch is equipped to furnish cold drawn Seamless Tubes in lengths never before produced except by splicing. These long length coils of solid tubes, produced from a single piece of stock, vary in length from 109 ft. for $\frac{5}{8}$ in. O.D. tube to 1,000 ft. for $\frac{1}{8}$ in. O.D. tube. Smaller sizes can be drawn correspondingly longer because limitations of length are based on the size of the initial tube stock.

Long length coils have been found particularly advantageous in the installation of central unit refrigerating systems where they have been suspended on hangers, bent around obstructions and threaded through walls, eliminating the time and cost of making numerous joints, and providing greater security because a one piece tube reduces the possibility of leakage. These long length tubes are also used to advantage for oil burner installations and offer economies in the fabrication of parts requiring shorter sections because the amount of scrap is greatly reduced over that resulting when standard mill lengths are used.

Further information and prices furnished upon request.

AMERICAN METAL HOSE BRANCH

American Flexible Hose is manufactured in a number of patterns and can be furnished in any workable metal. The pattern to be used depends on the service for which it is intended. For the general run of services a high tensile strength, non-rusting bronze or a special galvanized steel is used.

While applicable to any hose service, American Flexible Metal Hose and Tubing is designed to withstand severe service and for applications where chemical action, intense heat or extreme pressures tend to limit the life of any other kind of hose.

Bronze Steam Hose: For normal services and pressures BD15 unbraided interlocked hose is usually recommended. Where constant flexing, high pressures, or rough handling is unavoidable, type BD20 braided steam hose is preferable because of its greater strength. Both of these types are corrosion-resisting, and easily withstand the effects of moisture, heat and high pressures. Where steam is to be superheated, galvanized steel hose is recommended in preference to bronze. Packed I P T couplings are threaded onto the profile of the hose. Common uses: boiler tube blowing, heating tank cars, hydraulic connections and any other purpose where high temperature moisture and corrosion tend to shorten the life or limit the use of other types of hose. Made in sizes ½ in. to 8 in. inclusive.

Oil Hose: Similar to BD15 and BD20 Bronze except that it is made from a special galvanized steel and the couplings are usually soldered on. Common uses: flexible lubrication lines; unloading tank cars; conveying tar, asphalt and grease.

Heater Tubing: A four-walled light weight tubing made from metal .010 to .012 thick is admirably adapted to the conveying of hot air to the carburetor on automobiles, airplanes, tractors, etc. Also, used as protective armor for electric wiring, flexible connections on dusting machines, air-conductors on hair-drying equipment, dust conveyors, and many other uses where a light, dependable tubing is needed for services not involving liquids or high pressures.

Descriptive literature and prices furnished upon request.

AMERICAN METAL HOSE BRANCH

Seamless Flexible Tubing: Made from one solid continuous piece of metal into which are pressed deep helical or annular convolutions to impart the necessary flexibility. It has no seams, welds, laps, joints nor packing, and is absolutely leakproof and seep-proof. This tubing is unusually flexible and its popularity has become widespread for such uses as conveying Ammonia or Sulphur Dioxide gas, for conveying illuminating gas, oil and gasoline lines, hydraulic feeds and speed mechanisms on machine tools.

When protected with a double wire braiding and equipped with heatproof couplings, American Seamless is listed by the National Board of Fire Underwriters as standard equipment for fuel lines on Oil Burners.

Movable Platen Press Connections: A patented Brass Bracket Support holds the flexible seamless tubing constantly in a horizontal position thus eliminating the formation of water pockets. Since flexing is equalized, the movement is controlled within well-defined limits without concentration of bending. Uses: to convey steam, or steam and cold water alternately to the platens on molding and plastic presses.

Gas Holder Heating Hose: Made in two styles—A and B. Style A is made up of an inner core of BD15 Flexible Bronze Interlocked Tubing over which is applied a quarter inch layer of asbestos rope and an outside covering of either bronze wire or weatherproofed cotton jacket. Style B has an additional layer of bronze lacing immediately over the inside core giving added strength.

Other Products: In addition to the above, the American Metal Hose Branch of The American Brass Company manufactures square locked flexible metal conduit for casings and protective armor; also flexible metal tubing for gasoline hose, vacuum cleaner hose, exhaust hose, brass lamp arms and a variety of other types. The Technical Department, with over 25 years' experience, will gladly cooperate in the solution of flexible hose and tubing problems.

Descriptive literature and prices furnished upon request.

WATERBURY BRASS GOODS BRANCH

The Waterbury Brass Goods Branch manufactures an almost infinite variety of metal parts from Copper, Brass, Bronze, Nickel Silver and special alloys. It possesses the largest assortment of tools for eyelets available in this country.

Through wide experience in the design of complicated metal parts and batteries of the most modern automatic machines, this branch is in a position to offer worthwhile economies in the development and manufacture of fabricated metal products. Its engineers and designers are always available to customers for consultation on materials, design and manufacture.

Following is a listing of departments producing standard products:

Tru-Flange* Eyelets—Largest selection of stock eyelets manufactured in America.

Grommets—Standard sizes carried in stock. Special styles made to order.

Cups and Shells—All shapes and sizes finished or unfinished, such as clock cases, speedometer cases, vacuum bottle cases, fire extinguisher shells, soap boxes, vanity cases, etc.

Blanks and Stampings—Of every description, such as watch blanks and washers made from heavy and light metal.

"Star"* Fasteners—"Star" and "Griptite"* paper and sample fasteners, loop fasteners, shanks, staples, suspension rings and braces and many other small brass and wire novelties.

Electrical and Radio—Screw shells, fuse caps, ferrules and clips, terminals, push button and receptacle plates. Vacuum tube base pins and electrodes.

Ferrules—For desk and chair legs, pipes, tool handles of all description, cutlery handles, pencils, etc.

"Holtite"* Brazing Solder—Supplied at short notice for all classes of brazing.

Finishing—Finishing departments are large and well equipped, producing all the standard and special finishes.

Descriptive literature and prices furnished upon request.

*Trade-marks Reg. U. S. Pat. Off.

ANACONDA SHEETS

— WEIGHT TABLES —

ANACONDA

from mine to consumer

REG. U.S. PAT. OFF.

SHEETS

MEMORANDA

YELLOW BRASS STRIP

Pounds Per Linear Foot

Brown & Sharpe's Gauge

Thickness		Widths—in Inches					
Gauges	Inches	1/8	3/16	1/4	5/16	3/8	7/16
6	.1620	.07436	.1115	.1487	.1859	.2231	.2603
7	.1443	.06623	.09935	.1325	.1656	.1987	.2318
8	.1285	.05898	.08847	.1180	.1475	.1769	.2064
9	.1144	.05251	.07876	.1050	.1313	.1575	.1838
10	.1019	.04677	.07016	.09354	.1169	.1403	.1637
11	.0907	.04163	.06245	.08326	.1041	.1249	.1457
12	.0808	.03709	.05563	.07417	.09272	.1113	.1298
13	.0720	.03305	.04957	.06610	.08262	.09914	.1157
14	.0641	.02942	.04413	.05884	.07355	.08827	.1030
15	.0571	.02621	.03931	.05242	.06552	.07863	.09173
16	.0508	.02332	.03498	.04663	.05829	.06995	.08161
17	.0453	.02079	.03119	.04159	.05198	.06238	.07277
18	.0403	.01850	.02775	.03700	.04624	.05549	.06474
19	.0359	.01648	.02472	.03296	.04120	.04943	.05767
20	.0320	.01469	.02203	.02938	.03672	.04406	.05141
21	.0285	.01308	.01962	.02616	.03270	.03924	.04579
22	.0254	.01166	.01749	.02332	.02915	.03498	.04081
23	.0226	.01037	.01556	.02075	.02593	.03112	.03631
24	.0201	.009226	.01384	.01845	.02306	.02768	.03229
25	.0179	.008216	.01232	.01643	.02054	.02465	.02876
26	.0159	.007298	.01095	.01460	.01825	.02189	.02554
27	.0142	.006518	.009777	.01304	.01629	.01955	.02281
28	.0126	.005783	.008675	.01157	.01446	.01735	.02024
29	.0113	.005187	.007780	.01037	.01297	.01556	.01815
30	.0100	.004590	.006885	.009180	.01148	.01377	.01607

To determine the weight of Strip for other alloys, multiply the above weights by the following factors:

Red Brass-80%	Commercial Bronze-90%	Copper
1.0229	1.0392	1.0523

18% Nickel Silver-719	5% Phosphor Bronze-351
1.0327	1.0458

Variations from these weights must be expected in practice.

YELLOW BRASS STRIP

Pounds Per Linear Foot

Brown & Sharpe's Gauge

Thickness		Widths—in Inches						
Gauges	Inches	1/2	9/16	5/8	11/16	3/4	13/16	7/8
6	.1620	.2974	.3346	.3718	.4090	.4461	.4833	.5205
7	.1443	.2649	.2981	.3312	.3643	.3974	.4305	.4636
8	.1285	.2359	.2654	.2949	.3244	.3539	.3834	.4129
9	.1144	.2100	.2363	.2625	.2888	.3151	.3413	.3676
10	.1019	.1871	.2105	.2339	.2572	.2806	.3040	.3274
11	.0907	.1665	.1873	.2082	.2290	.2498	.2706	.2914
12	.0808	.1483	.1669	.1854	.2040	.2225	.2411	.2596
13	.0720	.1322	.1487	.1652	.1818	.1983	.2148	.2313
14	.0641	.1177	.1324	.1471	.1618	.1765	.1912	.2060
15	.0571	.1048	.1179	.1310	.1441	.1573	.1704	.1835
16	.0508	.09327	.1049	.1166	.1282	.1399	.1516	.1632
17	.0453	.08317	.09357	.1040	.1144	.1248	.1352	.1455
18	.0403	.07399	.08324	.09249	.1017	.1110	.1202	.1295
19	.0359	.06591	.07415	.08239	.09063	.09887	.1071	.1153
20	.0320	.05875	.06610	.07344	.08078	.08813	.09547	.1028
21	.0285	.05233	.05887	.06541	.07195	.07849	.08503	.09157
22	.0254	.04663	.05246	.05829	.06412	.06995	.07578	.08161
23	.0226	.04149	.04668	.05187	.05705	.06224	.06743	.07261
24	.0201	.03690	.04152	.04613	.05074	.05536	.05997	.06458
25	.0179	.03286	.03697	.04108	.04519	.04930	.05340	.05751
26	.0159	.02919	.03284	.03649	.04014	.04379	.04744	.05109
27	.0142	.02607	.02933	.03259	.03585	.03911	.04237	.04562
28	.0126	.02313	.02603	.02892	.03181	.03470	.03759	.04048
29	.0113	.02075	.02334	.02593	.02853	.03112	.03371	.03631
30	.0100	.01836	.02066	.02295	.02525	.02754	.02984	.03213

To determine the weight of Strip for other alloys, multiply the above weights by the following factors:

Red Brass-80%	Commercial Bronze-90%	Copper
1.0229	1.0392	1.0523

18% Nickel Silver-719	5% Phosphor Bronze-351
1.0327	1.0458

Variations from these weights must be expected in practice.

YELLOW BRASS STRIP

Pounds Per Linear Foot

Brown & Sharpe's Gauge

Thickness		Widths—in Inches						
Gauges	Inches	15/16	1	2	3	4	5	6
6	.1620	.5577	.5949	1.190	1.785	2.379	2.974	3.569
7	.1443	.4968	.5299	1.060	1.590	2.119	2.649	3.179
8	.1285	.4424	.4719	.9437	1.416	1.887	2.359	2.831
9	.1144	.3938	.4201	.8402	1.260	1.680	2.100	2.520
10	.1019	.3508	.3742	.7484	1.123	1.497	1.871	2.245
11	.0907	.3122	.3331	.6661	.9992	1.332	1.665	1.998
12	.0808	.2782	.2967	.5934	.8901	1.187	1.483	1.780
13	.0720	.2479	.2644	.5288	.7932	1.058	1.322	1.586
14	.0641	.2207	.2354	.4708	.7061	.9415	1.177	1.412
15	.0571	.1966	.2097	.4193	.6290	.8387	1.048	1.258
16	.0508	.1749	.1865	.3731	.5596	.7462	.9327	1.119
17	.0453	.1559	.1663	.3327	.4990	.6654	.8317	.9981
18	.0403	.1387	.1480	.2960	.4439	.5919	.7399	.8879
19	.0359	.1236	.1318	.2637	.3955	.5273	.6591	.7910
20	.0320	.1102	.1175	.2350	.3525	.4700	.5875	.7050
21	.0285	.09811	.1047	.2093	.3140	.4186	.5233	.6279
22	.0254	.08744	.09327	.1865	.2798	.3731	.4663	.5596
23	.0226	.07780	.08299	.1660	.2490	.3319	.4149	.4979
24	.0201	.06919	.07381	.1476	.2214	.2952	.3690	.4428
25	.0179	.06162	.06573	.1315	.1972	.2629	.3286	.3944
26	.0159	.05474	.05838	.1168	.1752	.2335	.2919	.3503
27	.0142	.04888	.05214	.1043	.1564	.2086	.2607	.3129
28	.0126	.04338	.04627	.09253	.1388	.1851	.2313	.2776
29	.0113	.03890	.04149	.08299	.1245	.1660	.2075	.2490
30	.0100	.03443	.03672	.07344	.1102	.1469	.1836	.2203

To determine the weight of Strip for other alloys, multiply the above weights by the following factors:

Red Brass-80%
1.0229

Commercial Bronze-90%
1.0392

Copper
1.0523

18% Nickel Silver-719
1.0327

5% Phosphor Bronze-351
1.0458

Variations from these weights must be expected in practice.

YELLOW BRASS STRIP

Pounds Per Linear Foot

Brown & Sharpe's Gauge

Thickness		Widths—in Inches					
Gauges	Inches	7	8	9	10	11	12
6	.1620	4.164	4.759	5.354	5.949	6.544	7.138
7	.1443	3.709	4.239	4.769	5.299	5.829	6.358
8	.1285	3.303	3.775	4.247	4.719	5.190	5.662
9	.1144	2.941	3.361	3.781	4.201	4.621	5.041
10	.1019	2.619	2.993	3.368	3.742	4.116	4.490
11	.0907	2.331	2.664	2.997	3.331	3.664	3.997
12	.0808	2.077	2.374	2.670	2.967	3.264	3.560
13	.0720	1.851	2.115	2.379	2.644	2.908	3.173
14	.0641	1.648	1.883	2.118	2.354	2.589	2.825
15	.0571	1.468	1.677	1.887	2.097	2.306	2.516
16	.0508	1.306	1.492	1.679	1.865	2.052	2.238
17	.0453	1.164	1.331	1.497	1.663	1.830	1.996
18	.0403	1.036	1.184	1.332	1.480	1.628	1.776
19	.0359	.9228	1.055	1.186	1.318	1.450	1.582
20	.0320	.8225	.9400	1.058	1.175	1.293	1.410
21	.0285	.7326	.8372	.9419	1.047	1.151	1.256
22	.0254	.6529	.7462	.8394	.9327	1.026	1.119
23	.0226	.5809	.6639	.7469	.8299	.9129	.9958
24	.0201	.5167	.5905	.6643	.7381	.8119	.8857
25	.0179	.4601	.5258	.5916	.6573	.7230	.7887
26	.0159	.4087	.4671	.5255	.5838	.6422	.7006
27	.0142	.3650	.4171	.4693	.5214	.5736	.6257
28	.0126	.3239	.3701	.4164	.4627	.5089	.5552
29	.0113	.2905	.3319	.3734	.4149	.4564	.4979
30	.0100	.2570	.2938	.3305	.3672	.4039	.4406

To determine the weight of Strip for other alloys, multiply the above weights by the following factors:

Red Brass-80%	Commercial Bronze-90%	Copper
1.0229	**1.0392**	**1.0523**

18% Nickel Silver-719	5% Phosphor Bronze-351
1.0327	**1.0458**

Variations from these weights must be expected in practice.

SHEET METAL

WEIGHTS BY GAUGE NUMBERS

Pounds Per Square Foot

Brown & Sharpe's Gauge

Thickness		Yellow Brass	Copper	Nickel Silver 18%-719	Everdur 1010
Gauges	Inches				
0000	.4600	20.27	21.33	20.93	20.40
000	.4096	18.05	18.99	18.64	18.17
00	.3648	16.07	16.92	16.60	16.18
0	.3249	14.32	15.06	14.78	14.41
1	.2893	12.75	13.41	13.16	12.83
2	.2576	11.35	11.94	11.72	11.43
3	.2294	10.11	10.64	10.44	10.17
4	.2043	9.002	9.473	9.296	9.061
5	.1819	8.015	8.434	8.277	8.068
6	.1620	7.138	7.512	7.372	7.185
7	.1443	6.358	6.691	6.566	6.400
8	.1285	5.662	5.958	5.847	5.699
9	.1144	5.041	5.304	5.206	5.074
10	.1019	4.490	4.725	4.637	4.519
11	.0907	3.997	4.206	4.127	4.023
12	.0808	3.560	3.747	3.677	3.584
13	.0720	3.173	3.338	3.276	3.193
14	.0641	2.825	2.972	2.917	2.843
15	.0571	2.516	2.648	2.598	2.532
16	.0508	2.238	2.355	2.312	2.253
17	.0453	1.996	2.100	2.061	2.009
18	.0403	1.776	1.869	1.834	1.787
19	.0359	1.582	1.665	1.634	1.592
20	.0320	1.410	1.484	1.456	1.419
21	.0285	1.256	1.321	1.297	1.264
22	.0254	1.119	1.178	1.156	1.127
23	.0226	.9958	1.048	1.028	1.002
24	.0201	.8857	.9320	.9146	.8915
25	.0179	.7887	.8300	.8145	.7939
26	.0159	.7006	.7373	.7235	.7052
27	.0142	.6257	.6584	.6462	.6298
28	.0126	.5552	.5842	.5734	.5588
29	.0113	.4979	.5240	.5142	.5012
30	.0100	.4406	.4637	.4550	.4435
31	.0089	.3922	.4127	.4050	.3947
32	.0080	.3525	.3709	.3640	.3548
33	.0071	.3129	.3292	.3231	.3149
34	.0063	.2776	.2921	.2867	.2794
35	.0056	.2468	.2597	.2548	.2484
36	.0050	.2203	.2318	.2275	.2218
37	.0045	.1983	.2087	.2048	.1996
38	.0040	.1763	.1855	.1820	.1774
39	.0035	.1542	.1623	.1593	.1552
40	.0031	.1366	.1437	.1411	.1375

To determine the weight of sheets for other alloys—

Multiply the above weights for Nickel Silver as follows:

10% Nickel Silver-752 .9905 — 15% Nickel Silver-739 .9937 — 20% or 30% Ambrac 1.0127

Multiply the above weights for Yellow Brass as follows:

Tobin Bronze .9935 — 5% Phosphor Bronze-351 1.0458

Variations from these weights must be expected in practice.

SHEET METAL

WEIGHTS BY FRACTIONAL INCH THICKNESSES

Pounds Per Square Foot

Thickness—Inches		Yellow Brass	Copper	Nickel Silver 18%-719	Everdur 1010
Fraction	Decimal				
1/16	.0625	2.754	2.898	2.844	2.772
1/8	.125	5.508	5.796	5.688	5.544
3/16	.1875	8.262	8.694	8.532	8.316
1/4	.250	11.02	11.59	11.38	11.09
5/16	.3125	13.77	14.49	14.22	13.86
3/8	.375	16.52	17.39	17.06	16.63
7/16	.4375	19.28	20.29	19.91	19.40
1/2	.500	22.03	23.18	22.75	22.18
9/16	.5625	24.79	26.08	25.60	24.95
5/8	.625	27.54	28.98	28.44	27.72
11/16	.6875	30.29	31.88	31.28	30.49
3/4	.750	33.05	34.78	34.13	33.26
13/16	.8125	35.80	37.67	36.97	36.04
7/8	.875	38.56	40.57	39.82	38.81
15/16	.9375	41.31	43.47	42.66	41.58
1	1.00	44.06	46.37	45.50	44.35
1 1/16	1.0625	46.82	49.27	48.35	47.12
1 1/8	1.125	49.57	52.16	51.19	49.90
1 3/16	1.1875	52.33	55.06	54.04	52.67
1 1/4	1.250	55.08	57.96	56.88	55.44
1 5/16	1.3125	57.83	60.86	59.72	58.21
1 3/8	1.375	60.59	63.76	62.57	60.98
1 7/16	1.4375	63.34	66.65	65.41	63.76
1 1/2	1.50	66.10	69.55	68.26	66.53
1 9/16	1.5625	68.85	72.45	71.10	69.30
1 5/8	1.625	71.60	75.35	73.94	72.07
1 11/16	1.6875	74.36	78.25	76.79	74.84
1 3/4	1.750	77.11	81.14	79.63	77.62
1 13/16	1.8125	79.87	84.04	82.48	80.39
1 7/8	1.875	82.62	86.94	85.32	83.16
1 15/16	1.9375	85.37	89.84	88.16	85.93
2	2.00	88.13	92.74	91.01	88.70

To determine the weight of sheets for other alloys—

Multiply the above weights for Nickel Silver as follows:

10% Nickel Silver-752	15% Nickel Silver-739	20% or 30% Ambrac
.9905	.9937	1.0127

Multiply the above weights for Yellow Brass as follows:

Tobin Bronze	5% Phosphor Bronze-351
.9935	1.0458

Variations from these weights must be expected in practice.

EVERDUR-1010 SHEETS AND PLATES

Pounds Per Square Foot

Brown & Sharpe's Gauge

(U. S. Standard Gauge—See opposite page)

Thickness		Weights
Gauges	Inches	
0000	.4600	20.40
000	.4096	18.17
00	.3648	16.18
0	.3249	14.41
1	.2893	12.83
2	.2576	11.43
3	.2294	10.17
4	.2043	9.061
5	.1819	8.068
6	.1620	7.185
7	.1443	6.400
8	.1285	5.699
9	.1144	5.074
10	.1019	4.519
11	.0907	4.023
12	.0808	3.584
13	.0720	3.193
14	.0641	2.843
15	.0571	2.532
16	.0508	2.253
17	.0453	2.009
18	.0403	1.787
19	.0359	1.592
20	.0320	1.419
21	.0285	1.264
22	.0254	1.127
23	.0226	1.002

Variations from these weights must be expected in practice.

EVERDUR-1010 SHEETS AND PLATES

Pounds Per Square Foot

United States Standard Gauge
(B. & S. Gauge—See opposite page)

Thickness		Weights
Gauges	Inches	
0000000	.500	22.18
000000	.4688	20.79
00000	.4375	19.40
0000	.4063	18.02
000	.375	16.63
00	.3438	15.25
0	.3125	13.86
1	.2813	12.48
2	.2656	11.78
3	.25	11.09
4	.2344	10.40
5	.2188	9.704
6	.2031	9.008
7	.1875	8.316
8	.1719	7.624
9	.1563	6.932
10	.1406	6.236
11	.125	5.544
12	.1094	4.852
13	.0938	4.160
14	.0781	3.464
15	.0703	3.118
16	.0625	2.772
17	.0563	2.497
18	.05	2.218
19	.0438	1.943
20	.0375	1.663
21	.0344	1.526
22	.0313	1.388
23	.0281	1.246
24	.025	1.109
25	.0219	.9713
26	.0188	.8338

Variations from these weights must be expected in practice.

STANDARD COPPER SHEETS

Rolled To Weight

Weight per Sq. Ft.		Thickness Inches	Nearest B & S Gauge		Nearest 64th Inch
Ounces	Pounds		No.	Inch	
	16	.3451	00	.3648	11/32
	15	.3235	0	.3249	21/64
	14	.3019	1	.2893	19/64
	13	.2804	1	.2893	9/32
	12	.2588	2	.2576	17/64
	11	.2372	3	.2294	15/64
	10	.2157	4	.2043	7/32
	9½	.2049	4	.2043	13/64
	9	.1941	4	.2043	3/16
	8½	.1833	5	.1819	3/16
	8	.1725	5	.1819	11/64
	7½	.1617	6	.1620	5/32
	7	.1510	7	.1443	5/32
	6½	.1402	7	.1443	9/64
	6	.1294	8	.1285	1/8
	5½	.1186	9	.1144	1/8
80	5	.1078	10	.1019	7/64
72	4½	.0970	10	.1019	3/32
64	4	.0863	11	.0907	3/32
56	3½	.0755	13	.0720	5/64
48	3	.0647	14	.0641	1/16
44	2¾	.0593	15	.0571	1/16
40	2½	.0539	16	.0508	3/64
36	2¼	.0485	16	.0508	3/64
32	2	.0431	17	.0453	3/64
28	1¾	.0377	19	.0359	1/32
24	1½	.0323	20	.0320	1/32
20	1¼	.0270	21	.0285	1/32
18	1⅛	.0243	22	.0254	1/32
16	1	.0216	23	.0226	1/64
14	⅞	.0189	25	.0179	1/64
12	¾	.0162	26	.0159	1/64
10	⅝	.0135	27	.0142	1/64
8	½	.0108	29	.0113	
6	⅜	.0081	32	.0080	
4	¼	.0054	35	.0056	
2	⅛	.0027			

Variations from these figures must be expected in practice.

STANDARD COPPER SHEETS

Pounds Per Sheet

Sheet Sizes		Oz. Weights and Equiv. Inches				
		8 oz.	10 oz.	12 oz.	14 oz.	16 oz.
Inches	Sq. Ft.	(.0108)	(.0135)	(.0162)	(.0189)	(.0216)
14 x 48	4⅔	2.33	2.92	3.50	4.08	4.67
20 x 96	13⅓	6.67	8.33	10.00	11.67	13.33
24 x 48	8	4.00	5.00	6.00	7.00	8.00
24 x 60	10	5.00	6.25	7.50	8.75	10.00
24 x 72	12	6.00	7.50	9.00	10.50	12.00
24 x 84	14	7.00	8.75	10.50	12.25	14.00
24 x 96	16	8.00	10.00	12.00	14.00	16.00
26 x 96	17⅓	8.67	10.83	13.00	15.17	17.33
28 x 96	18⅔	9.33	11.67	14.00	16.33	18.67
30 x 60	12½	6.25	7.81	9.38	10.94	12.50
30 x 72	15	7.50	9.38	11.25	13.13	15.00
30 x 84	17½		10.94	13.13	15.31	17.50
30 x 96	20			15.00	17.50	20.00
30 x 120	25			18.75	21.88	25.00
32 x 96	21⅓			16.00	18.67	21.33
34 x 96	22⅔			17.00	19.83	22.67
36 x 72	18			13.50	15.75	18.00
36 x 84	21			15.75	18.38	21.00
36 x 96	24			18.00	21.00	24.00
36 x 120	30			22.50	26.25	30.00
48 x 72	24			18.00	21.00	24.00

Variations from these weights must be expected in practice.

STANDARD COPPER SHEETS

Pounds Per Sheet

Sheet Sizes		Oz. Weights and Equiv. Inches				
Inches	Sq. Ft.	18 oz. (.0243)	20 oz. (.0270)	24 oz. (.0323)	28 oz. (.0377)	30 oz. (.0404)
14 x 48	4⅔	5.25	5.83	7.00	8.17	8.75
20 x 96	13⅓	15.00	16.67	20.00	23.33	25.00
24 x 48	8	9.00	10.00	12.00	14.00	15.00
24 x 60	10	11.25	12.50	15.00	17.50	18.75
24 x 72	12	13.50	15.00	18.00	21.00	22.50
24 x 84	14	15.75	17.50	21.00	24.50	26.25
24 x 96	16	18.00	20.00	24.00	28.00	30.00
26 x 96	17⅓	19.50	21.67	26.00	30.33	32.50
28 x 96	18⅔	21.00	23.33	28.00	32.67	35.00
30 x 60	12½	14.06	15.63	18.75	21.88	23.44
30 x 72	15	16.88	18.75	22.50	26.25	28.13
30 x 84	17½	19.69	21.88	26.25	30.63	32.81
30 x 96	20	22.50	25.00	30.00	35.00	37.50
30 x 120	25	28.13	31.25	37.50	43.75	46.88
32 x 96	21⅓	24.00	26.67	32.00	37.33	40.00
34 x 96	22⅔	25.50	28.33	34.00	39.67	42.50
36 x 72	18	20.25	22.50	27.00	31.50	33.75
36 x 84	21	23.63	26.25	31.50	36.75	39.38
36 x 96	24	27.00	30.00	36.00	42.00	45.00
36 x 120	30	33.75	37.50	45.00	52.50	56.25
48 x 72	24	27.00	30.00	36.00	42.00	45.00
60 x 120	50	56.25	62.50	75.00	87.50	93.75

Variations from these weights must be expected in practice.

STANDARD COPPER SHEETS

Pounds Per Sheet

Sheet Sizes		Oz. Weights and Equiv. Inches				
Inches	Sq. Ft.	32 oz. (.0431)	36 oz. (.0485)	40 oz. (.0539)	44 oz. (.0593)	48 oz. (.0647)
14 x 48	4⅔	9.33	10.50	11.67	12.83	14.00
20 x 96	13⅓	26.67	30.00	33.33	36.67	40.00
24 x 48	8	16.00	18.00	20.00	22.00	24.00
24 x 60	10	20.00	22.50	25.00	27.50	30.00
24 x 72	12	24.00	27.00	30.00	33.00	36.00
24 x 84	14	28.00	31.50	35.00	38.50	42.00
24 x 96	16	32.00	36.00	40.00	44.00	48.00
26 x 96	17⅓	34.67	39.00	43.33	47.67	52.00
28 x 96	18⅔	37.33	42.00	46.67	51.33	56.00
30 x 60	12½	25.00	28.13	31.25	34.38	37.50
30 x 72	15	30.00	33.75	37.50	41.25	45.00
30 x 84	17½	35.00	39.38	43.75	48.13	52.50
30 x 96	20	40.00	45.00	50.00	55.00	60.00
30 x 120	25	50.00	56.25	62.50	68.75	75.00
32 x 96	21⅓	42.67	48.00	53.33	58.67	64.00
34 x 96	22⅔	45.33	51.00	56.67	62.33	68.00
36 x 72	18	36.00	40.50	45.00	49.50	54.00
36 x 84	21	42.00	47.25	52.50	57.75	63.00
36 x 96	24	48.00	54.00	60.00	66.00	72.00
36 x 120	30	60.00	67.50	75.00	82.50	90.00
48 x 72	24	48.00	54.00	60.00	66.00	72.00
60 x 120	50	100.00	112.50	125.00	137.50	150.00

Variations from these weights must be expected in practice.

"ELECTRO-SHEET" COPPER

Standard Widths and Thicknesses

Approximate Weights Per Roll

Oz. per Sq. Ft.	Thickness Inches	Width Inches	Pounds per Roll		
			25 ft.	50 ft.	100 ft.
1	.0013	30	3.91	7.81	15.63
1	.0013	50	6.51	13.02	26.04
1½	.0020	30	5.86	11.72	23.44
1½	.0020	50	9.77	19.53	39.06
2	.0027	30	7.81	15.63	31.25
2	.0027	40	10.42	20.83	41.67
3	.0040	30	11.72	23.44	46.88
3	.0040	40	15.63	31.25	62.50
4	.0054	30	15.63	31.25	62.50
4	.0054	40	20.83	41.67	83.33
5	.0067	30	19.53	39.06	78.13
5	.0067	40	26.04	52.08	104.17
6	.0081	30	23.44	46.88	93.75
6	.0081	40	31.25	62.50	125.00
7	.0094	30	27.34	54.69	109.38
7	.0094	40	36.46	72.92	145.83

Variations from these weights must be expected in practice.

YELLOW BRASS CIRCLES

Pounds Per Circle

Brown & Sharpe's Gauge

Thickness		Diameters of Circles—in Inches					
Gauges	Inches	2	2¼	2½	2¾	3
¼″	.250	.2403	.3042	.3755	.4544	.5407
4	.2043	.1964	.2486	.3069	.3713	.4419
3/16″	.1875	.1802	.2281	.2816	.3408	.4056
5	.1819	.1749	.2213	.2732	.3306	.3934
6	.1620	.1557	.1971	.2433	.2944	.3504
7	.1443	.1387	.1756	2168	.2623	.3121
8	.1285	.1235	.1563	.1930	.2336	.2779
⅛″	.125	.1202	.1521	.1878	.2272	.2704
9	.1144	.1100	.1392	.1718	.2079	.2474
10	.1019	.09796	.1240	.1531	.1852	.2204
3/32″	.0938	.09017	.1141	.1409	.1705	.2029
11	.0907	.08719	.1104	.1362	.1648	.1962
12	.0808	.07768	.09831	.1214	.1469	.1748
13	.0720	.06922	.08760	.1081	.1309	.1557
14	.0641	.06162	.07799	.09628	.1165	.1386
1/16″	.0625	.06008	.07604	.09388	.1136	.1352
15	.0571	.05489	.06947	.08577	.1038	.1235
16	.0508	.04884	.06181	.07631	.09233	.1099
17	.0453	.04355	.05512	.06804	.08233	.09798
18	.0403	.03874	.04903	.06053	.07325	.08717
19	.0359	.03451	.04368	.05392	.06525	.07765
20	.0320	.03076	.03893	.04807	.05816	.06922
1/32″	.0313	.03009	.03808	.04702	.05689	.06770
21	.0285	.02740	.03468	.04281	.05180	.06165
22	.0254	.02442	.03090	.03815	.04616	.05494
23	.0226	.02173	.02750	.03395	.04108	.04888
24	.0201	.01932	.02446	.03019	.03653	.04348
25	.0179	.01721	.02178	.02689	.03253	.03872
26	.0159	.01529	.01935	.02388	.02890	.03439
27	.0142	.01365	.01728	.02133	.02581	.03071
28	.0126	.01211	.01533	.01893	.02290	.02725
29	.0113	.01086	.01375	.01697	.02054	.02444
30	.0100	.009613	.01217	.01502	.01818	.02163

To determine the weight of Circles for other alloys, multiply the above weights by the following factors:

Red Brass-80% **1.0229**

Commercial Bronze-90% **1.0392**

Copper **1.0523**

18% Nickel Silver-719 **1.0327**

5% Phosphor Bronze-351 **1.0458**

Note: Circumferences and Areas of Circles may be found on page 135.

Variations from these weights must be expected in practice.

YELLOW BRASS CIRCLES

Pounds Per Circle

Brown & Sharpe's Gauge

Thickness		Diameters of Circles—in Inches				
Gauges	Inches	3 1/4	3 1/2	3 3/4	4	4 1/4
1/4"	.250	.6346	.7360	.8449	.9613	1.085
4	.2043	.5186	.6015	.6905	.7856	.8869
3/16"	.1875	.4760	.5520	.6337	.7210	.8139
5	.1819	.4618	.5355	.6148	.6995	.7896
6	.1620	.4112	.4769	.5475	.6229	.7032
7	.1443	.3663	.4248	.4877	.5549	.6264
8	.1285	.3262	.3783	.4343	.4941	.5578
1/8"	.125	.3173	.3680	.4225	.4807	.5426
9	.1144	.2904	.3368	.3866	.4399	.4966
10	.1019	.2587	.3000	.3444	.3918	.4423
3/32"	.0938	.2381	.2762	.3170	.3607	.4072
11	.0907	.2302	.2670	.3065	.3488	.3937
12	.0808	.2051	.2379	.2731	.3107	.3508
13	.0720	.1828	.2120	.2433	.2769	.3126
14	.0641	.1627	.1887	.2166	.2465	.2783
1/16"	.0625	.1587	.1840	.2112	.2403	.2713
15	.0571	.1449	.1681	.1930	.2196	.2479
16	;.0508	.1290	.1496	.1717	.1953	.2205
17	.0453	.1150	.1334	.1531	.1742	.1966
18	.0403	.1023	.1186	.1362	.1550	.1749
19	.0359	.09113	.1057	.1213	.1380	.1558
20	.0320	.08123	.09421	.1081	.1230	.1389
1/32"	.0313	.07946	.09215	.1058	.1204	.1359
21	.0285	.07235	.08391	.09632	.1096	.1237
22	.0254	.06448	.07478	.08584	.09767	.1103
23	.0226	.05737	.06654	.07638	.08690	.09811
24	.0201	.05102	.05918	.06793	.07729	.08725
25	.0179	.04544	.05270	.06050	.06883	.07770
26	.0159	.04036	.04681	.05374	.06114	.06902
27	.0142	.03605	.04181	.04799	.05460	.06164
28	.0126	.03199	.03710	.04258	.04845	.05470
29	.0113	.02869	.03327	.03819	.04345	.04905
30	.0100	.02539	.02944	.03380	.03845	.04341

To determine the weight of Circles for other alloys, multiply the above weights by the following factors:

Red Brass-80%	Commercial Bronze-90%	Copper
1.0229	1.0392	1.0523

18% Nickel Silver-719	5% Phosphor Bronze-351
1.0327	1.0458

Variations from these weights must be expected in practice.

YELLOW BRASS CIRCLES

Pounds Per Circle

Brown & Sharpe's Gauge

Thickness		Diameter of Circles—in Inches				
Gauges	Inches	4½	4¾	5	5¼	5½
¼″	.250	1.217	1.356	1.502	1.656	1.818
4	.2043	.9943	1.108	1.227	1.353	1.485
3/16″	.1875	.9125	1.017	1.127	1.242	1.363
5	.1819	.8853	.9864	1.093	1.205	1.322
6	.1620	.7884	.8784	.9733	1.073	1.178
7	.1443	.7023	.7825	.8670	.9559	1.049
8	.1285	.6254	.6968	.7721	.8512	.9342
⅛″	.125	.6083	.6778	.7510	.8280	.9088
9	.1144	.5568	.6203	.6873	.7578	.8317
10	.1019	.4959	.5526	.6122	.6750	.7408
3/32″	.0938	.4565	.5086	.5636	.6213	.6819
11	.0907	.4414	.4918	.5450	.6008	.6594
12	.0808	.3932	.4381	.4855	.5352	.5874
13	.0720	.3504	.3904	.4326	.4769	.5234
14	.0641	.3120	.3476	.3851	.4246	.4660
1/16″	.0625	.3042	.3389	.3755	.4140	.4544
15	.0571	.2779	.3096	.3431	.3782	.4151
16	.0508	.2472	.2755	.3052	.3365	.3693
17	.0453	.2205	.2456	.2722	.3001	.3293
18	.0403	.1961	.2185	.2421	.2670	.2930
19	.0359	.1747	.1947	.2157	.2378	.2610
20	.0320	.1557	.1735	.1923	.2120	.2326
1/32″	.0313	.1523	.1697	.1881	.2073	.2276
21	.0285	.1387	.1545	.1712	.1888	.2072
22	.0254	.1236	.1377	.1526	.1683	.1847
23	.0226	.1100	.1225	.1358	.1497	.1643
24	.0201	.09782	.1090	.1208	.1331	.1461
25	.0179	.08711	.09706	.1075	.1186	.1301
26	.0159	.07738	.08622	.09553	.1053	.1156
27	.0142	.06911	.07700	.08532	.09406	.1032
28	.0126	.06132	.06832	.07570	.08346	.09160
29	.0113	.05499	.06127	.06789	.07485	.08215
30	.0100	.04867	.05422	.06008	.06624	.07270

To determine the weight of Circles for other alloys, multiply the above weights by the following factors:

Red Brass-80%	Commercial Bronze-90%	Copper
1.0229	1.0392	1.0523

18% Nickel Silver-719	5% Phosphor Bronze-351
1.0327	1.0458

Variations from these weights must be expected in practice.

YELLOW BRASS CIRCLES

Pounds Per Circle

Brown & Sharpe's Gauge

Thickness		Diameters of Circles—in Inches				
Gauges	Inches	5¾	6	6¼	6½	6¾
¼″	.250	1.986	2.163	2.347	2.539	2.738
4	.2043	1.623	1.768	1.918	2.074	2.237
3/16″	.1875	1.490	1.622	1.760	1.904	2.053
5	.1819	1.445	1.574	1.708	1.847	1.992
6	.1620	1.287	1.402	1.521	1.645	1.774
7	.1443	1.147	1.248	1.355	1.465	1.580
8	.1285	1.021	1.112	1.206	1.305	1.407
⅛″	.125	.9932	1.081	1.173	1.269	1.369
9	.1144	.9090	.9898	1.074	1.162	1.253
10	.1019	.8097	.8816	.9566	1.035	1.116
3/32″	.0938	.7453	.8116	.8806	.9524	1.027
11	.0907	.7207	.7847	.8515	.9210	.9932
12	.0808	.6420	.6991	.7585	.8204	.8848
13	.0720	.5721	.6229	.6759	.7311	.7884
14	.0641	.5093	.5546	.6018	.6509	.7019
1/16″	.0625	.4966	.5407	.5867	.6346	.6844
15	.0571	.4537	.4940	.5361	.5798	.6253
16	.0508	.4037	.4395	.4769	.5158	.5563
17	.0453	.3600	.3919	.4253	.4600	.4960
18	.0403	.3202	.3487	.3783	.4092	.4413
19	.0359	.2853	.3106	.3370	.3645	.3931
20	.0320	.2543	.2769	.3004	.3249	.3504
1/32″	.0313	.2487	.2708	.2938	.3178	.3427
21	.0285	.2265	.2466	.2676	.2894	.3121
22	.0254	.2018	.2198	.2385	.2579	.2781
23	.0226	.1796	.1955	.2122	.2295	.2475
24	.0201	.1597	.1739	.1887	.2041	.2201
25	.0179	.1422	.1549	.1680	.1818	.1960
26	.0159	.1263	.1376	.1493	.1614	.1741
27	.0142	.1128	.1229	.1333	.1442	.1555
28	.0126	.1001	.1090	.1183	.1279	.1380
29	.0113	.08979	.09777	.1061	.1147	.1237
30	.0100	.07946	.08652	.09388	.1015	.1095

To determine the weight of Circles for other alloys, multiply the above weights by the following factors:

Red Brass-80%
1.0229

Commercial Bronze-90%
1.0392

Copper
1.0523

18% Nickel Silver-719
1.0327

5% Phosphor Bronze-351
1.0458

Variations from these weights must be expected in practice.

YELLOW BRASS CIRCLES

Pounds Per Circle

Brown & Sharpe's Gauge

Thickness		Diameters of Circles—in Inches				
Gauges	Inches	7	7¼	7½	7¾	8
¼″	.250	2.944	3.158	3.380	3.609	3.845
4	.2043	2.406	2.581	2.762	2.949	3.142
3/16″	.1875	2.208	2.369	2.535	2.707	2.884
5	.1819	2.142	2.298	2.459	2.626	2.798
6	.1620	1.908	2.046	2.190	2.338	2.492
7	.1443	1.699	1.823	1.951	2.083	2.220
8	.1285	1.513	1.623	1.737	1.855	1.976
⅛″	.125	1.472	1.579	1.690	1.804	1.923
9	.1144	1.347	1.445	1.547	1.651	1.760
10	.1019	1.200	1.287	1.378	1.471	1.567
3/32″	.0938	1.105	1.185	1.268	1.354	1.443
11	.0907	1.068	1.146	1.226	1.309	1.395
12	.0808	.9515	1.021	1.092	1.166	1.243
13	.0720	.8479	.9095	.9733	1.039	1.107
14	.0641	.7549	.8097	.8665	.9253	.9859
1/16″	.0625	.7360	.7895	.8449	.9022	.9613
15	.0571	.6724	.7213	.7719	.8242	.8783
16	.0508	.5982	.6417	.6867	.7333	.7814
17	.0453	.5335	.5723	.6124	.6539	.6968
18	.0403	.4746	.5091	.5448	.5817	.6199
19	.0359	.4228	.4535	.4853	.5182	.5522
20	.0320	.3768	.4042	.4326	.4619	.4922
1/32″	.0313	.3686	.3954	.4231	.4518	.4814
21	.0285	.3356	.3600	.3853	.4114	.4384
22	.0254	.2991	.3209	.3434	.3666	.3907
23	.0226	.2661	.2855	.3055	.3262	.3476
24	.0201	.2367	.2539	.2717	.2901	.3092
25	.0179	.2108	.2261	.2420	.2584	.2753
26	.0159	.1872	.2009	.2149	.2295	.2446
27	.0142	.1672	.1794	.1920	.2050	.2184
28	.0126	.1484	.1592	.1703	.1819	.1938
29	.0113	.1331	.1427	.1528	.1631	.1738
30	.0100	.1178	.1263	.1352	.1443	.1538

To determine the weight of Circles for other alloys, multiply the above weights by the following factors:

Red Brass-80%	Commercial Bronze-90%	Copper
1.0229	1.0392	1.0523

18% Nickel Silver-719	5% Phosphor Bronze-351
1.0327	1.0458

Variations from these weights must be expected in practice.

YELLOW BRASS CIRCLES

Pounds Per Circle

Brown & Sharpe's Gauge

Thickness		Diameters of Circles—in Inches				
Gauges	Inches	8¼	8½	8¾	9	9¼
¼″	.250	4.089	4.341	4.600	4.867	5.141
4	.2043	3.342	3.547	3.759	3.977	4.201
3/16″	.1875	3.067	3.256	3.450	3.650	3.856
5	.1819	2.975	3.159	3.347	3.541	3.740
6	.1620	2.650	2.813	2.981	3.154	3.331
7	.1443	2.360	2.506	2.655	2.809	2.967
8	.1285	2.102	2.231	2.364	2.501	2.642
⅛″	.125	2.045	2.171	2.300	2.433	2.570
9	.1144	1.871	1.986	2.105	2.227	2.352
10	.1019	1.667	1.769	1.875	1.984	2.095
3/32″	.0938	1.534	1.629	1.726	1.826	1.929
11	.0907	1.484	1.575	1.669	1.766	1.865
12	.0808	1.322	1.403	1.487	1.573	1.662
13	.0720	1.178	1.250	1.325	1.402	1.481
14	.0641	1.049	1.113	1.179	1.248	1.318
1/16″	.0625	1.022	1.085	1.150	1.217	1.285
15	.0571	.9340	.9915	1.051	1.112	1.174
16	.0508	.8310	.8821	.9347	.9889	1.045
17	.0453	.7410	.7866	.8335	.8819	.9315
18	.0403	.6592	.6998	.7415	.7845	.8287
19	.0359	.5872	.6234	.6606	.6989	.7382
20	.0320	.5234	.5556	.5888	.6229	.6580
1/32″	.0313	.5120	.5435	.5759	.6093	.6436
21	.0285	.4662	.4949	.5244	.5548	.5861
22	.0254	.4155	.4410	.4674	.4945	.5223
23	.0226	.3697	.3924	.4158	.4400	.4647
24	.0201	.3288	.3490	.3698	.3913	.4133
25	.0179	.2928	.3108	.3294	.3485	.3681
26	.0159	.2601	.2761	.2926	.3095	.3270
27	.0142	.2323	.2466	.2613	.2764	.2920
28	.0126	.2061	.2188	.2318	.2453	.2591
29	.0113	.1848	.1962	.2079	.2200	.2324
30	.0100	.1636	.1736	.1840	.1947	.2056

To determine the weight of Circles for other alloys, multiply the above weights by the following factors:

Red Brass-80%
1.0229

Commercial Bronze-90%
1.0392

Copper
1.0523

18% Nickel Silver-719
1.0327

5% Phosphor Bronze-351
1.0458

Variations from these weights must be expected in practice.

YELLOW BRASS CIRCLES

Pounds Per Circle

& Sharpe's Gauge

Thickness		Diameters of Circles—in Inches				
Gauges	Inches	9½	9¾	10	10¼	10½
¼″	.250	5.423	5.712	6.008	6.312	6.624
4	.2043	4.431	4.668	4.910	5.159	5.413
3/16″	.1875	4.067	4.284	4.506	4.734	4.968
5	.1819	3.945	4.156	4.372	4.593	4.820
6	.1620	3.514	3.701	3.893	4.090	4.292
7	.1443	3.130	3.297	3.468	3.644	3.823
8	.1285	2.787	2.936	3.088	3.245	3.405
⅛″	.125	2.711	2.856	3.004	3.156	3.312
9	.1144	2.481	2.614	2.749	2.889	3.031
10	.1019	2.210	2.328	2.449	2.573	2.700
3/32″	.0938	2.035	2.143	2.254	2.368	2.485
11	.0907	1.967	2.072	2.180	2.290	2.403
12	.0808	1.753	1.846	1.942	2.040	2.141
13	.0720	1.562	1.645	1.730	1.818	1.908
14	.0641	1.390	1.464	1.541	1.619	1.698
1/16″	.0625	1.356	1.428	1.502	1.578	1.656
15	.0571	1.238	1.305	1.372	1.442	1.513
16	.0508	1.102	1.161	1.221	1.283	1.346
17	.0453	.9826	1.035	1.089	1.144	1.200
18	.0403	.8741	.9207	.9685	1.018	1.068
19	.0359	.7787	.8202	.8628	.9065	.9512
20	.0320	.6941	.7311	.7691	.8080	.8479
1/32″	.0313	.6789	.7151	.7522	.7903	.8293
21	.0285	.6182	.6511	.6849	.7196	.7552
22	.0254	.5509	.5803	.6104	.6413	.6730
23	.0226	.4902	.5163	.5432	.5706	.5988
24	.0201	.4360	.4592	.4831	.5075	.5326
25	.0179	.3883	.4090	.4302	.4520	.4743
26	.0159	.3449	.3633	.3821	.4015	.4213
27	.0142	.3080	.3244	.3413	.3585	.3763
28	.0126	.2733	.2879	.3028	.3181	.3339
29	.0113	.2451	.2582	.2716	.2853	.2994
30	.0100	.2169	.2285	.2403	.2525	.2650

To determine the weight of Circles for other alloys, multiply the above weights by the following factors:

Red Brass-80%	Commercial Bronze-90%	Copper
1.0229	**1.0392**	**1.0523**

18% Nickel Silver-719	5% Phosphor Bronze-351
1.0327	**1.0458**

Variations from these weights must be expected in practice.

YELLOW BRASS CIRCLES

Pounds Per Circle

Brown & Sharpe's Gauge

Thickness		Diameters of Circles—in Inches				
Gauges	Inches	10¾	11	11¼	11½	11¾
¼″	.250	6.943	7.270	7.604	7.946	8.295
4	.2043	5.674	5.941	6.214	6.493	6.779
3/16″	.1875	5.207	5.453	5.703	5.959	6.221
5	.1819	5.052	5.290	5.533	5.781	6.036
6	.1620	4.499	4.711	4.928	5.149	5.375
7	.1443	4.008	4.196	4.389	4.586	4.788
8	.1285	3.569	3.737	3.909	4.084	4.264
⅛″	.125	3.472	3.635	3.802	3.973	4.148
9	.1144	3.177	3.327	3.480	3.636	3.796
10	.1019	2.830	2.963	3.099	3.239	3.381
3/32″	.0938	2.605	2.728	2.853	2.981	3.112
11	.0907	2.519	2.638	2.759	2.883	3.009
12	.0808	2.244	2.350	2.458	2.568	2.681
13	.0720	2.000	2.094	2.190	2.288	2.389
14	.0641	1.780	1.864	1.950	2.037	2.127
1/16″	.0625	1.736	1.818	1.901	1.986	2.074
15	.0571	1.586	1.660	1.737	1.815	1.895
16	.0508	1.411	1.477	1.545	1.615	1.686
17	.0453	1.258	1.317	1.378	1.440	1.503
18	.0403	1.119	1.172	1.226	1.281	1.337
19	.0359	.9971	1.044	1.092	1.141	1.191
20	.0320	.8887	.9306	.9733	1.017	1.062
1/32″	.0313	.8693	.9102	.9520	.9948	1.039
21	.0285	.7915	.8288	.8669	.9058	.9456
22	.0254	.7054	.7386	.7726	.8073	.8428
23	.0226	.6277	.6572	.6874	.7183	.7499
24	.0201	.5582	.5845	.6114	.6389	.6669
25	.0179	.4971	.5205	.5445	.5689	.5939
26	.0159	.4416	.4624	.4836	.5054	.5276
27	.0142	.3944	.4129	.4319	.4513	.4712
28	.0126	.3499	.3664	.3833	.4005	.4181
29	.0113	.3138	.3286	.3437	.3592	.3749
30	.0100	.2777	.2908	.3042	.3178	.3318

To determine the weight of Circles for other alloys, multiply the above weights by the following factors:

Red Brass-80%	Commercial Bronze-90%	Copper
1.0229	1.0392	1.0523

18% Nickel Silver-719	5% Phosphor Bronze-351
1.0327	1.0458

Variations from these weights must be expected in practice.

YELLOW BRASS CIRCLES

Pounds Per Circle

Brown & Sharpe's Gauge

Thickness		Diameters of Circles—in Inches				
Gauges	Inches	12	12¼	12½	12¾	13
¼″	.250	8.652	9.016	9.388	9.767	10.15
4	.2043	7.070	7.368	7.672	7.982	8.298
3/16″	.1875	6.489	6.762	7.041	7.325	7.616
5	.1819	6.295	6.560	6.831	7.107	7.388
6	.1620	5.606	5.842	6.083	6.329	6.580
7	.1443	4.994	5.204	5.419	5.638	5.861
8	.1285	4.447	4.634	4.825	5.020	5.219
⅛″	.125	4.326	4.508	4.694	4.884	5.077
9	.1144	3.959	4.126	4.296	4.469	4.646
10	.1019	3.527	3.675	3.827	3.981	4.139
3/32″	.0938	3.246	3.383	3.522	3.665	3.810
11	.0907	3.139	3.271	3.406	3.544	3.684
12	.0808	2.796	2.914	3.034	3.157	3.282
13	.0720	2.492	2.597	2.704	2.813	2.924
14	.0641	2.218	2.312	2.407	2.504	2.603
1/16″	.0625	2.163	2.254	2.347	2.442	2.539
15	.0571	1.976	2.059	2.144	2.231	2.319
16	.0508	1.758	1.832	1.908	1.985	2.063
17	.0453	1.568	1.634	1.701	1.770	1.840
18	.0403	1.395	1.453	1.513	1.574	1.637
19	.0359	1.242	1.295	1.348	1.403	1.458
20	.0320	1.107	1.154	1.202	1.250	1.300
1/32″	.0313	1.083	1.129	1.175	1.223	1.271
21	.0285	.9863	1.028	1.070	1.113	1.158
22	.0254	.8790	.9160	.9538	.9924	1.032
23	.0226	.7821	.8151	.8487	.8830	.9179
24	.0201	.6956	.7249	.7548	.7853	.8164
25	.0179	.6195	.6456	.6722	.6993	.7270
26	.0159	.5503	.5734	.5971	.6212	.6458
27	.0142	.4914	.5121	.5332	.5548	.5767
28	.0126	.4361	.4544	.4732	.4923	.5118
29	.0113	.3911	.4075	.4243	.4415	.4590
30	.0100	.3461	.3606	.3755	.3907	.4062

To determine the weight of Circles for other alloys, multiply the above weights by the following factors:

Red Brass-80%	Commercial Bronze-90%	Copper
1.0229	**1.0392**	**1.0523**

18% Nickel Silver-719	5% Phosphor Bronze-351
1.0327	1.0458

Variations from these weights must be expected in practice.

YELLOW BRASS CIRCLES

Pounds Per Circle

Brown & Sharpe's Gauge

Thickness		Diameters of Circles—in Inches				
Gauges	Inches	13¼	13½	13¾	14	14¼
¼″	.250	10.55	10.95	11.36	11.78	12.20
4	.2043	8.620	8.948	9.283	9.624	9.970
3/16″	.1875	7.911	8.213	8.520	8.832	9.150
5	.1819	7.675	7.967	8.265	8.568	8.877
6	.1620	6.835	7.096	7.361	7.631	7.906
7	.1443	6.088	6.320	6.557	6.797	7.042
8	.1285	5.422	5.628	5.839	6.053	6.271
⅛″	.125	5.274	5.475	5.680	5.888	6.100
9	.1144	4.827	5.011	5.198	5.389	5.583
10	.1019	4.299	4.463	4.630	4.800	4.973
3/32″	.0938	3.958	4.108	4.262	4.418	4.578
11	.0907	3.827	3.973	4.121	4.272	4.426
12	.0808	3.409	3.539	3.671	3.806	3.943
13	.0720	3.038	3.154	3.272	3.392	3.514
14	.0641	2.705	2.808	2.913	3.019	3.128
1/16″	.0625	2.637	2.738	2.840	2.944	3.050
15	.0571	2.409	2.501	2.594	2.690	2.787
16	.0508	2.143	2.225	2.308	2.393	2.479
17	.0453	1.911	1.984	2.058	2.134	2.211
18	.0403	1.700	1.765	1.831	1.898	1.967
19	.0359	1.515	1.572	1.631	1.691	1.752
20	.0320	1.350	1.402	1.454	1.507	1.562
1/32″	.0313	1.321	1.371	1.422	1.474	1.528
21	.0285	1.203	1.248	1.295	1.342	1.391
22	.0254	1.072	1.113	1.154	1.196	1.240
23	.0226	.9536	.9899	1.027	1.065	1.103
24	.0201	.8481	.8804	.9133	.9468	.9809
25	.0179	.7553	.7840	.8133	.8432	.8736
26	.0159	.6709	.6964	.7225	.7490	.7760
27	.0142	.5991	.6220	.6452	.6689	.6930
28	.0126	.5316	.5519	.5725	.5935	.6149
29	.0113	.4768	.4949	.5134	.5323	.5515
30	.0100	.4219	.4380	.4544	.4711	.4880

To determine the weight of Circles for other alloys, multiply the above weights by the following factors:

Red Brass-80%
1.0229

Commercial Bronze-90%
1.0392

Copper
1.0523

18% Nickel Silver-719
1.0327

5% Phosphor Bronze-351
1.0458

Variations from these weights must be expected in practice.

YELLOW BRASS CIRCLES

Pounds Per Circle

Brown & Sharpe's Gauge

Thickness		Diameters of Circles—in Inches				
Gauges	Inches	14½	14¾	15	15¼	15½
¼″	.250	12.63	13.07	13.52	13.97	14.43
4	.2043	10.32	10.68	11.05	11.42	11.80
3/16″	.1875	9.474	9.804	10.14	10.48	10.83
5	.1819	9.191	9.511	9.836	10.17	10.50
6	.1620	8.186	8.471	8.760	9.055	9.354
7	.1443	7.291	7.545	7.803	8.065	8.332
8	.1285	6.493	6.719	6.949	7.182	7.420
⅛″	.125	6.316	6.536	6.759	6.987	7.217
9	.1144	5.781	5.982	6.186	6.394	6.605
10	.1019	5.149	5.328	5.510	5.695	5.884
3/32″	.0938	4.740	4.905	5.072	5.243	5.416
11	.0907	4.583	4.742	4.905	5.069	5.237
12	.0808	4.083	4.225	4.369	4.516	4.665
13	.0720	3.638	3.765	3.893	4.024	4.157
14	.0641	3.239	3.352	3.466	3.583	3.701
1/16″	.0625	3.158	3.268	3.380	3.493	3.609
15	.0571	2.885	2.986	3.088	3.191	3.297
16	.0508	2.567	2.656	2.747	2.839	2.933
17	.0453	2.289	2.369	2.450	2.532	2.616
18	.0403	2.036	2.107	2.179	2.252	2.327
19	.0359	1.814	1.877	1.941	2.007	2.073
20	.0320	1.617	1.673	1.730	1.789	1.848
1/32″	.0313	1.582	1.637	1.693	1.749	1.807
21	.0285	1.440	1.490	1.541	1.593	1.646
22	.0254	1.283	1.328	1.373	1.420	1.467
23	.0226	1.142	1.182	1.222	1.263	1.305
24	.0201	1.016	1.051	1.087	1.123	1.161
25	.0179	.9045	.9359	.9679	1.000	1.034
26	.0159	.8034	.8314	.8598	.8887	.9181
27	.0142	.7175	.7425	.7679	.7937	.8199
28	.0126	.6367	.6588	.6813	.7042	.7275
29	.0113	.5710	.5908	.6110	.6316	.6525
30	.0100	.5053	.5229	.5407	.5589	.5774

To determine the weight of Circles for other alloys, multiply the above weights by the following factors:

Red Brass-80%	Commercial Bronze-90%	Copper
1.0229	1.0392	1.0523

18% Nickel Silver-719	5% Phosphor Bronze-351
1.0327	1.0458

Variations from these weights must be expected in practice.

YELLOW BRASS CIRCLES

Pounds Per Circle

Brown & Sharpe's Gauge

Thickness		Diameters of Circles—in Inches				
Gauges	Inches	15¾	16	16¼	16½	16¾
¼″	.250	14.90	15.38	15.87	16.36	16.86
4	.2043	12.18	12.57	12.97	13.37	13.78
3/16″	.1875	11.18	11.54	11.90	12.27	12.64
5	.1819	10.84	11.19	11.54	11.90	12.27
6	.1620	9.658	9.967	10.28	10.60	10.92
7	.1443	8.603	8.878	9.158	9.442	9.730
8	.1285	7.661	7.906	8.155	8.408	8.664
⅛″	.125	7.452	7.691	7.933	8.179	8.429
9	.1144	6.820	7.038	7.260	7.485	7.714
10	.1019	6.075	6.269	6.467	6.667	6.871
3/32″	.0938	5.592	5.771	5.953	6.137	6.325
11	.0907	5.407	5.580	5.756	5.935	6.116
12	.0808	4.817	4.971	5.128	5.287	5.448
13	.0720	4.292	4.430	4.569	4.711	4.855
14	.0641	3.821	3.944	4.068	4.194	4.322
1/16″	.0625	3.726	3.845	3.966	4.089	4.214
15	.0571	3.404	3.513	3.624	3.736	3.850
16	.0508	3.029	3.125	3.224	3.324	3.425
17	.0453	2.701	2.787	2.875	2.964	3.054
18	.0403	2.403	2.479	2.558	2.637	2.717
19	.0359	2.140	2.209	2.278	2.349	2.421
20	.0320	1.908	1.969	2.031	2.094	2.158
1/32″	.0313	1.866	1.926	1.986	2.048	2.110
21	.0285	1.699	1.753	1.809	1.865	1.922
22	.0254	1.514	1.563	1.612	1.662	1.713
23	.0226	1.347	1.390	1.434	1.479	1.524
24	.0201	1.198	1.237	1.276	1.315	1.355
25	.0179	1.067	1.101	1.136	1.171	1.207
26	.0159	.9479	.9782	1.009	1.040	1.072
27	.0142	.8466	.8737	.9012	.9291	.9575
28	.0126	.7512	.7752	.7996	.8244	.8496
29	.0113	.6737	.6952	.7171	.7394	.7619
30	.0100	.5962	.6153	.6346	.6543	.6743

To determine the weight of Circles for other alloys, multiply the above weights by the following factors:

Red Brass-80% 1.0229	Commercial Bronze-90% 1.0392	Copper 1.0523
18% Nickel Silver-719 1.0327	5% Phosphor Bronze-351 1.0458	

Variations from these weights must be expected in practice.

YELLOW BRASS CIRCLES

Pounds Per Circle

Brown & Sharpe's Gauge

Thickness		Diameters of Circles—in Inches				
Gauges	Inches	17	17¼	17½	17¾	18
¼″	.250	17.36	17.88	18.40	18.93	19.47
4	.2043	14.19	14.61	15.04	15.47	15.91
3/16″	.1875	13,02	13.41	13.80	14.20	14.60
5	.1819	12.63	13.01	13.39	13.77	14.16
6	.1620	11.25	11.59	11.92	12.27	12.61
7	.1443	10.02	10.32	10.62	10.93	11.24
8	.1285	8.925	9.190	9.458	9.730	10.01
⅛″	.125	8.682	8.939	9.200	9.465	9.733
9	.1144	7.946	8.181	8.420	8.662	8.908
10	.1019	7.078	7.287	7.500	7.716	7.935
3/32″	.0938	6.515	6.708	6.904	7.102	7.304
11	.0907	6.300	6.486	6.676	6.868	7.063
12	.0808	5.612	5.778	5.947	6.118	6.292
13	.0720	5.001	5.149	5.299	5.452	5.606
14	.0641	4.452	4.584	4.718	4.854	4.991
1/16″	.0625	4.341	4.470	4.600	4.732	4.867
15	.0571	3.966	4.083	4.203	4.324	4.446
16	.0508	3.528	3.633	3.739	3.847	3.956
17	.0453	3.146	3.240	3.334	3.430	3.527
18	.0403	2.799	2.882	2.966	3.051	3.138
19	.0359	2.493	2.567	2.642	2.718	2.795
20	.0320	2.223	2.288	2.355	2.423	2.492
1/32″	.0313	2.174	2.238	2.304	2.370	2.437
21	.0285	1.979	2.038	2.098	2.158	2.219
22	.0254	1.764	1.816	1.869	1.923	1.978
23	.0226	1.570	1.616	1.663	1.711	1.760
24	.0201	1.396	1.437	1.479	1.522	1.565
25	.0179	1.243	1.280	1.317	1.355	1.394
26	.0159	1.104	1.137	1.170	1.204	1.238
27	.0142	.9863	1.015	1.045	1.075	1.106
28	.0126	.8751	.9011	.9274	.9541	.9811
29	.0113	.7849	.8081	.8317	.8556	.8799
30	.0100	.6946	.7151	.7360	.7572	.7787

To determine the weight of Circles for other alloys, multiply the above weights by the following factors:

Red Brass-80%	Commercial Bronze-90%	Copper
1.0229	1.0392	1.0523

18% Nickel Silver-719	5% Phosphor Bronze-351
1.0327	1.0458

Variations from these weights must be expected in practice.

YELLOW BRASS CIRCLES

Pounds Per Circle

Brown & Sharpe's Gauge

Thickness		Diameters of Circles—in Inches				
Gauges	Inches	18¼	18½	18¾	19	19¼
¼″	.250	20.01	20.56	21.12	21.69	22.26
4	.2043	16.35	16.80	17.26	17.73	18.19
3/16″	.1875	15.01	15.42	15.84	16.27	16.70
5	.1819	14.56	14.96	15.37	15.78	16.20
6	.1620	12.97	13.33	13.69	14.06	14.43
7	.1443	11.55	11.87	12.19	12.52	12.85
8	.1285	10.29	10.57	10.86	11.15	11.44
⅛″	.125	10.01	10.28	10.56	10.84	11.13
9	.1144	9.157	9.410	9.666	9.925	10.19
10	.1019	8.157	8.382	8.610	8.841	9.075
3/32″	.0938	7.508	7.715	7.925	8.138	8.354
11	.0907	7.260	7.460	7.663	7.869	8.078
12	.0808	6.468	6.646	6.827	7.010	7.196
13	.0720	5.763	5.922	6.083	6.247	6.412
14	.0641	5.131	5.272	5.416	5.561	5.709
1/16″	.0625	5.003	5.141	5.281	5.422	5.566
15	.0571	4.571	4.697	4.824	4.954	5.085
16	.0508	4.066	4.178	4.292	4.407	4.524
17	.0453	3.626	3.726	3.827	3.930	4.034
18	.0403	3.226	3.315	3.405	3.496	3.589
19	.0359	2.874	2.953	3.033	3.115	3.197
20	.0320	2.561	2.632	2.704	2.776	2.850
1/32″	.0313	2.505	2.575	2.645	2.716	2.788
21	.0285	2.281	2.344	2.408	2.473	2.538
22	.0254	2.033	2.089	2.146	2.204	2.262
23	.0226	1.809	1.859	1.910	1.961	2.013
24	.0201	1.609	1.653	1.698	1.744	1.790
25	.0179	1.433	1.472	1.512	1.553	1.594
26	.0159	1.273	1.308	1.343	1.379	1.416
27	.0142	1.137	1.168	1.200	1.232	1.265
28	.0126	1.009	1.036	1.065	1.093	1.122
29	.0113	.9045	.9295	.9548	.9804	1.006
30	.0100	.8005	.8225	.8449	.8676	.8906

To determine the weight of Circles for other alloys, multiply the above weights by the following factors:

Red Brass-80%
1.0229

Commercial Bronze-90%
1.0392

Copper
1.0523

18% Nickel Silver-719
1.0327

5% Phosphor Bronze-351
1.0458

Variations from these weights must be expected in practice.

YELLOW BRASS CIRCLES

Pounds Per Circle

Brown & Sharpe's Gauge

Thickness		Diameters of Circles—in Inches				
Gauges	Inches	19½	19¾	20	20¼	20½
¼″	.250	22.85	23.44	24.03	24.64	25.25
4	.2043	18.67	19.15	19.64	20.13	20.63
3/16″	.1875	17.13	17.58	18.03	18.48	18.94
5	.1819	16.62	17.05	17.49	17.93	18.37
6	.1620	14.80	15.19	15.57	15.97	16.36
7	.1443	13.19	13.53	13.87	14.22	14.57
8	.1285	11.74	12.05	12.35	12.66	12.98
⅛″	.125	11.42	11.72	12.02	12.32	12.63
9	.1144	10.45	10.72	11.00	11.27	11.55
10	.1019	9.312	9.553	9.796	10.04	10.29
3/32″	.0938	8.572	8.793	9.017	9.244	9.474
11	.0907	8.289	8.503	8.719	8.939	9.161
12	.0808	7.384	7.575	7.768	7.963	8.161
13	.0720	6.580	6.750	6.922	7.096	7.272
14	.0641	5.858	6.009	6.162	6.317	6.474
1/16″	.0625	5.712	5.859	6.008	6.159	6.313
15	.0571	5.218	5.353	5.489	5.627	5.767
16	.0508	4.642	4.762	4.884	5.006	5.131
17	.0453	4.140	4.247	4.355	4.464	4.575
18	.0403	3.683	3.778	3.874	3.972	4.070
19	.0359	3.281	3.365	3.451	3.538	3.626
20	.0320	2.924	3.000	3.076	3.154	3.232
1/32″	.0313	2.860	2.934	3.009	3.085	3.161
21	.0285	2.605	2.672	2.740	2.809	2.879
22	.0254	2.321	2.381	2.442	2.503	2.565
23	.0226	2.065	2.119	2.173	2.227	2.283
24	.0201	1.837	1.884	1.932	1.981	2.030
25	.0179	1.636	1.678	1.721	1.764	1.808
26	.0159	1.453	1.491	1.529	1.567	1.606
27	.0142	1.298	1.331	1.365	1.399	1.434
28	.0126	1.151	1.181	1.211	1.242	1.273
29	.0113	1.033	1.059	1.086	1.114	1.141
30	.0100	.9139	.9374	.9613	.9855	1.010

To determine the weight of Circles for other alloys, multiply the above weights by the following factors:

Red Brass-80% **1.0229**	Commercial Bronze-90% **1.0392**	Copper **1.0523**
18% Nickel Silver-719 **1.0327**	5% Phosphor Bronze-351 **1.0458**	

Variations from these weights must be expected in practice.

YELLOW BRASS CIRCLES

Pounds Per Circle

Brown & Sharpe's Gauge

Thickness		Diameter of Circles—in Inches				
Gauges	Inches	20¾	21	21¼	21½	21¾
¼″	.250	25.87	26.50	27.13	27.77	28.42
4	.2043	21.14	21.65	22.17	22.70	23.23
3/16″	.1875	19.40	19.87	20.35	20.83	21.32
5	.1819	18.82	19.28	19.74	20.21	20.68
6	.1620	16.76	17.17	17.58	18.00	18.42
7	.1443	14.93	15.29	15.66	16.03	16.41
8	.1285	13.30	13.62	13.95	14.28	14.61
⅛″	.125	12.93	13.25	13.57	13.89	14.21
9	.1144	11.84	12.12	12.42	12.71	13.01
10	.1019	10.54	10.80	11.06	11.32	11.59
3/32″	.0938	9.706	9.941	10.18	10.42	10.66
11	.0907	9.385	9.613	9.843	10.08	10.31
12	.0808	8.361	8.564	8.769	8.976	9.186
13	.0720	7.450	7.631	7.814	7.999	8.186
14	.0641	6.633	6.794	6.956	7.121	7.288
1/16″	.0625	6.467	6.624	6.783	6.943	7.106
15	.0571	5.909	6.052	6.197	6.343	6.492
16	.0508	5.257	5.384	5.513	5.644	5.776
17	.0453	4.688	4.801	4.916	5.033	5.150
18	.0403	4.170	4.271	4.374	4.477	4.582
19	.0359	3.715	3.805	3.896	3.988	4.082
20	.0320	3.311	3.392	3.473	3.555	3.638
1/32″	.0313	3.239	3.317	3.397	3.477	3.559
21	.0285	2.949	3.021	3.093	3.166	3.240
22	.0254	2.628	2.692	2.757	2.822	2.888
23	.0226	2.339	2.395	2.453	2.511	2.569
24	.0201	2.080	2.130	2.181	2.233	2.285
25	.0179	1.852	1.897	1.943	1.989	2.035
26	.0159	1.645	1.685	1.726	1.766	1.808
27	.0142	1.469	1.505	1.541	1.578	1.614
28	.0126	1.304	1.335	1.367	1.400	1.433
29	.0113	1.169	1.198	1.226	1.255	1.285
30	.0100	1.035	1.060	1.085	1.111	1.137

To determine the weight of Circles for other alloys, multiply the above weights by the following factors:

Red Brass-80%
1.0229

Commercial Bronze-90%
1.0392

Copper
1.0523

18% Nickel Silver-719
1.0327

5% Phosphor Bronze-351
1.0458

Variations from these weights must be expected in practice.

YELLOW BRASS CIRCLES

Pounds Per Circle

Brown & Sharpe's Gauge

Thickness		Diameters of Circles—in Inches				
Gauges	Inches	22	22 1/4	22 1/2	22 3/4	23
1/4"	.250	29.08	29.74	30.42	31.10	31.78
4	.2043	23.76	24.31	24.86	25.41	25.97
3/16"	.1875	21.81	22.31	22.81	23.32	23.84
5	.1819	21.16	21.64	22.13	22.63	23.13
6	.1620	18.84	19.27	19.71	20.15	20.60
7	.1443	16.79	17.17	17.56	17.95	18.35
8	.1285	14.95	15.29	15.63	15.98	16.34
1/8"	.125	14.54	14.87	15.21	15.55	15.89
9	.1144	13.31	13.61	13.92	14.23	14.54
10	.1019	11.85	12.12	12.40	12.68	12.96
3/32"	.0938	10.91	11.16	11.41	11.67	11.93
11	.0907	10.55	10.79	11.04	11.28	11.53
12	.0808	9.399	9.614	9.831	10.05	10.27
13	.0720	8.375	8.566	8.760	8.956	9.154
14	.0641	7.456	7.627	7.799	7.973	8.149
1/16"	.0625	7.270	7.436	7.604	7.774	7.946
15	.0571	6.642	6.794	6.947	7.102	7.259
16	.0508	5.909	6.044	6.181	6.319	6.459
17	.0453	5.269	5.390	5.512	5.635	5.759
18	.0403	4.688	4.795	4.903	5.013	5.124
19	.0359	4.176	4.271	4.368	4.465	4.564
20	.0320	3.722	3.807	3.893	3.980	4.068
1/32"	.0313	3.641	3.724	3.808	3.893	3.979
21	.0285	3.315	3.391	3.468	3.545	3.623
22	.0254	2.955	3.022	3.090	3.159	3.229
23	.0226	2.629	2.689	2.750	2.811	2.873
24	.0201	2.338	2.391	2.446	2.500	2.555
25	.0179	2.082	2.130	2.178	2.227	2.276
26	.0159	1.850	1.892	1.935	1.978	2.021
27	.0142	1.652	1.690	1.728	1.766	1.805
28	.0126	1.466	1.499	1.533	1.567	1.602
29	.0113	1.314	1.344	1.375	1.406	1.437
30	.0100	1.163	1.190	1.217	1.244	1.271

To determine the weight of Circles for other alloys, multiply the above weights by the following factors:

Red Brass-80%
1.0229

Commercial Bronze-90%
1.0392

Copper
1.0523

18% Nickel Silver-719
1.0327

5% Phosphor Bronze-351
1.0458

Variations from these weights must be expected in practice.

YELLOW BRASS CIRCLES

Pounds Per Circle

Brown & Sharpe's Gauge

Thickness		Diameters of Circles—in Inches			
Gauges	Inches	23 1/4	23 1/2	23 3/4	24
1/4"	.250	32.48	33.18	33.89	34.61
4	.2043	26.54	27.12	27.70	28.28
3/16"	.1875	24.36	24.89	25.42	25.96
5	.1819	23.63	24.14	24.66	25.18
6	.1620	21.05	21.50	21.96	22.43
7	.1443	18.75	19.15	19.56	19.98
8	.1285	16.69	17.05	17.42	17.79
1/8"	.125	16.24	16.59	16.95	17.30
9	.1144	14.86	15.18	15.51	15.84
10	.1019	13.24	13.52	13.81	14.11
3/32"	.0938	12.19	12.45	12.72	12.98
11	.0907	11.78	12.04	12.30	12.56
12	.0808	10.50	10.72	10.95	11.19
13	.0720	9.354	9.556	9.760	9.967
14	.0641	8.327	8.508	8.690	8.873
1/16"	.0625	8.120	8.295	8.473	8.652
15	.0571	7.418	7.578	7.741	7.904
16	.0508	6.600	6.742	6.887	7.032
17	.0453	5.885	6.012	6.141	6.271
18	.0403	5.236	5.349	5.463	5.579
19	.0359	4.664	4.765	4.867	4.970
20	.0320	4.157	4.247	4.338	4.430
1/32"	.0313	4.066	4.154	4.243	4.333
21	.0285	3.703	3.783	3.864	3.945
22	.0254	3.300	3.371	3.443	3.516
23	.0226	2.936	3.000	3.064	3.129
24	.0201	2.611	2.668	2.725	2.782
25	.0179	2.325	2.376	2.427	2.478
26	.0159	2.066	2.110	2.155	2.201
27	.0142	1.845	1.885	1.925	1.966
28	.0126	1.637	1.672	1.708	1.744
29	.0113	1.468	1.500	1.532	1.564
30	.0100	1.299	1.327	1.356	1.384

To determine the weight of Circles for other alloys, multiply the above weights by the following factors:

Red Brass-80% **1.0229**

Commercial Bronze-90% **1.0392**

Copper **1.0523**

18% Nickel Silver-719 **1.0327**

5% Phosphor Bronze-351 **1.0458**

Variations from these weights must be expected in practice.

ANACONDA WIRE

— WEIGHT TABLES —

ANACONDA

from mine to consumer

SHEETS

WIRE

MEMORANDA

YELLOW BRASS WIRE

Pounds Per Linear Foot

Brown & Sharpe's Gauge

Sizes		Weights	Sizes		Weights
Gauges	Inches		Gauges	Inches	
0000	.4600	.6083	19	.0359	.003705
000	.4096	.4823	20	.0320	.002944
00	.3648	.3825	21	.0285	.002335
0	.3249	.3034	22	.0254	.001855
1	.2893	.2406	23	.0226	.001468
2	.2576	.1907	24	.0201	.001161
3	.2294	.1513	25	.0179	.0009210
4	.2043	.1200	26	.0159	.0007267
5	.1819	.09511	27	.0142	.0005796
6	.1620	.07544	28	.0126	.0004564
7	.1443	.05986	29	.0113	.0003671
8	.1285	.04747	30	.0100	.0002875
9	.1144	.03762	31	.0089	.0002277
10	.1019	.02985	32	.0080	.0001840
11	.0907	.02365	33	.0071	.0001449
12	.0808	.01877	34	.0063	.0001141
13	.0720	.01490	35	.0056	.00009015
14	.0641	.01181	36	.0050	.00007186
15	.0571	.009372	37	.0045	.00005821
16	.0508	.007418	38	.0040	.00004599
17	.0453	.005899	39	.0035	.00003521
18	.0403	.004669	40	.0031	.00002762
				.0010	.000002875

To determine the weight of Wire for other alloys, multiply the above weights for Yellow Brass by the following factors:

Red Brass-80%	Commercial Bronze-90%	5% Phosphor Bronze-351
1.0262	1.0426	1.0492

Variations from these weights must be expected in practice.

EVERDUR—1010 WIRE

Pounds Per Linear Foot

Brown & Sharpe's Gauge

Sizes		Weights
Gauges	Inches	
1	.2893	.2430
2	.2576	.1926
3	.2294	.1528
4	.2043	.1212
5	.1819	.09605
6	.1620	.07618
7	.1443	.06044
8	.1285	.04793
9	.1144	.03799
10	.1019	.03014
11	.0907	.02388
12	.0808	.01895
13	.0720	.01505
14	.0641	.01193
15	.0571	.009464
16	.0508	.007491
17	.0453	.005957
18	.0403	.004714
19	.0359	.003741
20	.0320	.002972
21	.0285	.002358
22	.0254	.001873
23	.0226	.001483
24	.0201	.001173
25	.0179	.0009301
26	.0159	.0007339
27	.0142	.0005853
28	.0126	.0004609
29	.0113	.0003707
30	.0100	.0002903

Variations from these weights must be expected in practice.

18% NICKEL SILVER-723 WIRE

Weight

Brown & Sharpe's Gauge

Sizes		Lengths	Weights
Gauges	Inches	Feet per Lb.	Lbs. per Foot
0000	.4600	1.597	.6262
000	.4096	2.014	.4965
00	.3648	2.539	.3938
0	.3249	3.201	.3124
1	.2893	4.037	.2477
2	.2576	5.092	.1964
3	.2294	6.421	.1557
4	.2043	8.096	.1235
5	.1819	10.21	.09792
6	.1620	12.88	.07767
7	.1443	16.23	.06162
8	.1285	20.46	.04887
9	.1144	25.82	.03873
10	.1019	32.54	.03073
11	.09074	41.04	.02437
12	.08081	51.75	.01933
13	.07196	65.26	.01532
14	.06408	82.29	.01215
15	.05707	103.7	.009639
16	.05082	130.8	.007643
17	.04526	165.0	.006062
18	.04030	208.1	.004806
19	.03589	262.3	.003812
20	.03196	330.8	.003023
21	.02846	417.2	.002397
22	.02535	525.8	.001902
23	.02257	663.3	.001508
24	.02010	836.4	.001196
25	.01790	1055.	.0009482
26	.01594	1330.	.0007519
27	.01420	1676.	.0005967
28	.01264	2115.	.0004728
29	.01126	2665.	.0003752
30	.01003	3359.	.0002977
31	.008928	4239.	.0002359
32	.007950	5346.	.0001870
33	.007080	6741.	.0001483
34	.006305	8500.	.0001176
35	.005615	10720.	.00009330
36	.005000	13520.	.00007398
37	.004453	17040.	.00005868
38	.003965	21490.	.00004653
39	.003531	27100.	.00003690
40	.003145	34160.	.00002927

To determine the weight of Wire for other alloys, multiply the weight for 18% Nickel Silver-723 Wire by the following factors:

10% Nickel Silver-752	20% or 30% Ambrac
.9968	1.0191

Variations from these weights must be expected in practice.

18% NICKEL SILVER-723 WIRE

Resistance

Brown & Sharpe's Gauge

Sizes	Resistance (Standard—189 Ohms per Mil Foot)			
Gauges	Ohms per Foot	Feet per Ohm	Ohms per Lb.	Lbs. per Ohm
0000	.0008932	1120.	.001426	701.1
000	.001127	887.3	.002270	440.6
00	.001420	704.2	.003606	277.3
0	.001790	558.7	.005730	174.5
1	.002258	442.9	.009116	109.7
2	.002848	351.1	.01450	68.95
3	.003592	278.4	.02306	43.36
4	.004528	220.8	.03666	27.28
5	.005711	175.1	.05832	17.15
6	.007202	138.9	.09273	10.78
7	.009077	110.2	.1473	6.789
8	.01145	87.34	.2343	4.268
9	.01444	69.25	.3728	2.682
10	.01820	54.95	.5923	1.688
11	.02295	43.57	.9419	1.062
12	.02894	34.55	1.498	0.6678
13	.03650	27.40	2.382	.4198
14	.04603	21.72	3.788	.2640
15	.05802	17.24	6.020	.1661
16	.07318	13.66	9.575	.1044
17	.09227	10.84	15.22	.06570
18	.1164	8.591	24.22	.04129
19	.1467	6.817	38.48	.02598
20	.1850	5.405	61.20	.01634
21	.2333	4.286	97.33	.01027
22	.2941	3.400	154.6	.006466
23	.3710	2.695	246.1	.004063
24	.4678	2.138	391.3	.002556
25	.5899	1.695	622.1	.001607
26	.7438	1.344	989.2	.001011
27	.9386	1.065	1573.	.0006358
28	1.183	0.8453	2502.	.0003997
29	1.491	.6707	3974.	.0002517
30	1.879	.5322	6311.	.0001584
31	2.371	.4218	10050.	.00009949
32	2.990	.3344	15990.	.00006256
33	3.771	.2652	25420.	.00003934
34	4.756	.2103	40430.	.00002474
35	5.997	.1668	64270.	.00001556
36	7.560	.1323	102200.	.000009786
37	9.532	.1049	162400.	.000006156
38	12.02	.08319	258400.	.000003871
39	15.16	.06596	410900.	.000002434
40	19.11	.05233	652900.	.000001532

The resistance is subject to a variation of from 5% below to 10% above the figure given.

Every coil or spool of Resistance Wire is tested and plainly marked in Ohms per Foot before shipment.

Variations from these values must be expected in practice.

30% NICKEL SILVER-703 WIRE

Weight

Brown & Sharpe's Gauge

Sizes		Lengths	Weights
Gauges	Inches	Feet per Lb.	Lbs. per Foot
0000	.4600	1.587	.6302
000	.4096	2.001	.4997
00	.3648	2.523	.3963
0	.3249	3.181	.3144
1	.2893	4.012	.2493
2	.2576	5.060	.1976
3	.2294	6.381	.1567
4	.2043	8.045	.1243
5	.1819	10.15	.09854
6	.1620	12.79	.07816
7	.1443	16.13	.06201
8	.1285	20.33	.04918
9	.1144	25.66	.03898
10	.1019	32.34	.03092
11	.09074	40.78	.02452
12	.08081	51.42	.01945
13	.07196	64.84	.01542
14	.06408	81.77	.01223
15	.05707	103.1	.009700
16	.05082	130.0	.007692
17	.04526	163.9	.006101
18	.04030	206.7	.004837
19	.03589	260.7	.003836
20	.03196	328.7	.003042
21	.02846	414.5	.002412
22	.02535	522.5	.001914
23	.02257	659.1	.001517
24	.02010	831.1	.001203
25	.01790	1048.	.0009543
26	.01594	1321.	.0007567
27	.01420	1665.	.0006005
28	.01264	2102.	.0004758
29	.01126	2648.	.0003776
30	.01003	3338.	.0002996
31	.008928	4212.	.0002374
32	.007950	5313.	.0001882
33	.007080	6699.	.0001493
34	.006305	8446.	.0001184
35	.005615	10650.	.00009390
36	.005000	13430.	.00007446
37	.004453	16930	.00005906
38	.003965	21360.	.00004682
39	.003531	26930	.00003713
40	.003145	33950.	.00002946

Variations from these weights must be expected in practice.

30% NICKEL SILVER-703 WIRE

Resistance

Brown & Sharpe's Gauge

Sizes	Resistance (Standard—290 Ohms per Mil Foot)			
Gauges	Ohms per Foot	Feet per Ohm	Ohms per Lb.	Lbs. per Ohm
0000	.001371	729.4	.002176	459.7
000	.001729	578.4	.003460	289.0
00	.002179	458.9	.005498	181.9
0	.002747	364.0	.008738	114.4
1	.003465	288.6	.01390	71.94
2	.004370	228.8	.02211	45.22
3	.005511	181.5	.03516	28.44
4	.006948	143.9	.05589	17.89
5	.008765	114.1	.08895	11.24
6	.01105	90.50	.1414	7.073
7	.01393	71.79	.2246	4.452
8	.01756	56.95	.3571	2.801
9	.02216	45.13	.5685	1.759
10	.02793	35.80	.9032	1.107
11	.03522	28.39	1.436	0.6963
12	.04441	22.52	2.283	.4379
13	.05600	17.86	3.631	.2754
14	.07063	14.16	5.775	.1731
15	.08904	11.23	9.179	.1089
16	.1123	8.905	14.60	.06849
17	.1416	7.062	23.21	.04308
18	.1786	5.599	36.92	.02708
19	.2251	4.442	58.68	.01704
20	.2839	3.522	93.32	.01072
21	.3581	2.793	148.4	.006736
22	.4513	2.216	235.8	.004241
23	.5693	1.757	375.3	.002665
24	.7178	1.393	596.6	.001676
25	.9051	1.105	948.5	.001054
26	1.141	0.8764	1508.	.0006632
27	1.440	.6944	2398.	.0004170
28	1.815	.5510	3814.	.0002622
29	2.287	.4373	6057.	.0001651
30	2.883	.3469	9622.	.0001039
31	3.638	.2749	15320.	.00006525
32	4.588	.2180	24370.	.00004103
33	5.786	.1728	38760.	.00002580
34	7.297	.1370	61630.	.00001622
35	9.201	.1087	97990.	.00001021
36	11.60	.08621	155800.	.000006419
37	14.63	.06835	247700.	.000004037
38	18.45	.05420	394100.	.000002538
39	23.26	.04299	626400.	.000001596
40	29.32	.03411	995300.	.000001005

The resistance is subject to a variation of from 5% below to 10% above the figure given.

Every coil or spool of Resistance Wire is tested and plainly marked in Ohms per Foot before shipment.

Variations from these values must be expected in practice.

COPPER WIRE

Area

Brown & Sharpe's Gauge

Sizes	Diameters in Mils at 20° C.	Cross Sections at 20° C.	
Gauges		Circular Mils	Square Inches
0000	460.0	211600.	.1662
000	409.6	167800.	.1318
00	364.8	133100	.1045
0	324.9	105500.	.08289
1	289.3	83690.	.06573
2	257.6	66370.	.05213
3	229.4	52640.	.04134
4	204.3	41740.	.03278
5	181.9	33100.	.02600
6	162.0	26250.	.02062
7	144.3	20820.	.01635
8	128.5	16510.	.01297
9	114.4	13090.	.01028
10	101.9	10380.	.008155
11	90.74	8234.	.006467
12	80.81	6530.	.005129
13	71.96	5178.	.004067
14	64.08	4107.	.003225
15	57.07	3257.	.002558
16	50.82	2583.	.002028
17	45.26	2048.	.001609
18	40.30	1624.	.001276
19	35.89	1288.	.001012
20	31.96	1022.	.0008023
21	28.46	810.1	.0006363
22	25.35	642.4	.0005046
23	22.57	509.5	.0004002
24	20.10	404.0	.0003173
25	17.90	320.4	.0002517
26	15.94	254.1	.0001996
27	14.20	201.5	.0001583
28	12.64	159.8	.0001255
29	11.26	126.7	.00009953
30	10.03	100.5	.00007894
31	8.928	79.70	.00006260
32	7.950	63.21	.00004964
33	7.080	50.13	.00003937
34	6.305	39.75	.00003122
35	5.615	31.52	.00002476
36	5.000	25.00	.00001964
37	4.453	19.83	.00001557
38	3.965	15.72	.00001235
39	3.531	12.47	.000009793
40	3.145	9.888	.000007766
41	2.800	7.842	.000006159
42	2.494	6.219	.000004884
43	2.221	4.932	.000003873
44	1.978	3.911	.000003072
45	1.761	3.102	.000002436
46	1.568	2.460	.000001932
47	1.397	1.951	.000001532
48	1.244	1.547	.000001215
49	1.108	1.227	.0000009635
50	0.9863	0.9728	.0000007641
1 Mil	1.0000	1.0000	.0000007854

Variations from these figures must be expected in practice.

COPPER WIRE

Weight

Brown & Sharpe's Gauge

Sizes	Diameters	Weights and Lengths		
Gauges	in Mils at 20° C.	Feet per Pound	Pounds per 1000 Ft.	Pounds per Mile
0000	460.0	1.561	640.5	3382.
000	409.6	1.968	507.9	2682.
00	364.8	2.482	402.8	2127.
0	324.9	3.130	319.5	1687.
1	289.3	3.947	253.3	1338.
2	257.6	4.977	200.9	1061.
3	229.4	6.276	159.3	841.2
4	204.3	7.914	126.4	667.1
5	181.9	9.980	100.2	529.1
6	162.0	12.58	79.46	419.6
7	144.3	15.87	63.02	332.7
8	128.5	20.01	49.98	263.9
9	114.4	25.23	39.63	209.3
10	101.9	31.82	31.43	165.9
11	90.74	40.12	24.92	131.6
12	80.81	50.59	19.77	104.4
13	71.96	63.80	15.68	82.77
14	64.08	80.44	12.43	65.64
15	57.07	101.4	9.858	52.05
16	50.82	127.9	7.818	41.28
17	45.26	161.3	6.200	32.74
18	40.30	203.4	4.917	25.96
19	35.89	256.5	3.899	20.59
20	31.96	323.4	3.092	16.33
21	28.46	407.8	2.452	12.95
22	25.35	514.2	1.945	10.27
23	22.57	648.4	1.542	8.143
24	20.10	817.7	1.223	6.458
25	17.90	1031.	.9699	5.121
26	15.94	1300.	.7692	4.061
27	14.20	1639.	.6100	3.221
28	12.64	2067.	.4837	2.554
29	11.26	2607.	.3836	2.026
30	10.03	3287.	.3042	1.606
31	8.928	4145.	.2413	1.274
32	7.950	5227.	.1913	1.010
33	7.080	6591.	.1517	.8011
34	6.305	8310.	.1203	.6353
35	5.615	10480.	.09542	.5038
36	5.000	13210.	.07568	.3996
37	4.453	16660.	.06001	.3169
38	3.965	21010.	.04759	.2513
39	3.531	26500.	.03774	.1993
40	3.145	33410.	.02993	.1580
41	2.800	42130.	.02374	.1253
42	2.494	53120.	.01882	.09939
43	2.221	66990.	.01493	.07882
44	1.978	84470.	.01184	.06251
45	1.761	106500.	.009388	.04957
46	1.568	134300.	.007445	.03931
47	1.397	169400.	.005904	.03118
48	1.244	213600.	.004682	.02472
49	1.108	269300.	.003713	.01961
50	0.9863	339600.	.002945	.01555
1 Mil	1.0000	330400.	.003027	.01598

Variations from these weights must be expected in practice.

COPPER WIRE

Resistance

Brown & Sharpe's Gauge

Sizes	Resistance & Length		Resistance & Weight	
Gauges	Feet per Ohm	Ohms per 1000 Ft.	Ohms per Pound	Pounds per Ohm
0000	20400.	0.04901	0.00007652	13070.
000	16180.	.06180	.0001217	8219.
00	12830.	.07793	.0001935	5169.
0	10180.	.09827	.0003076	3251.
1	8070.	.1239	.0004891	2044.
2	6400.	.1563	.0007778	1286.
3	5075.	.1970	.001237	808.6
4	4025.	.2485	.001966	508.5
5	3192.	.3133	.003127	319.8
6	2531.	.3951	.004972	201.1
7	2007.	.4982	.007905	126.5
8	1592.	.6282	.01257	79.55
9	1262.	.7921	.01999	50.03
10	1001.	.9989	.03178	31.47
11	794.0	1.260	.05053	19.79
12	629.6	1.588	.08035	12.45
13	499.3	2.003	.1278	7.827
14	396.0	2.525	.2032	4.922
15	314.0	3.184	.3230	3.096
16	249.0	4.016	.5136	1.947
17	197.5	5.064	.8167	1.224
18	156.6	6.385	1.299	0.7700
19	124.2	8.051	2.065	.4843
20	98.50	10.15	3.283	.3046
21	78.11	12.80	5.221	.1915
22	61.95	16.14	8.301	.1205
23	49.13	20.36	13.20	.07576
24	38.96	25.67	20.99	.04765
25	30.90	32.37	33.37	.02997
26	24.50	40.81	53.06	.01885
27	19.43	51.47	84.37	.01185
28	15.41	64.90	134.2	.007454
29	12.22	81.83	213.3	.004688
30	9.691	103.2	339.2	.002948
31	7.685	130.1	539.3	.001854
32	6.095	164.1	857.6	.001166
33	4.833	206.9	1364.	.0007333
34	3.833	260.9	2168.	.0004612
35	3.040	329.0	3448.	.0002901
36	2.411	414.8	5482.	.0001824
37	1.912	523.1	8717.	.0001147
38	1.516	659.6	13860.	.00007215
39	1.202	831.8	22040.	.00004538
40	0.9534	1049.	35040.	.00002854
41	.7561	1323.	55720.	.00001795
42	.5996	1668.	88600.	.00001129
43	.4755	2103.	140900.	.000007098
44	.3771	2652.	224000.	.000004464
45	.2991	3344.	356200.	.000002808
46	.2372	4217.	566300.	.000001766
47	.1881	5317.	900500.	.000001110
48	.1492	6705.	1432000.	.0000006984
49	.1183	8454.	2277000.	.0000004392
50	.09380	10660.	3620000.	.0000002762
1 Mil	.09642	10371.2	3426000.	.0000002919

Variations from these values must be expected in practice.

ANACONDA RODS

— WEIGHT TABLES —

ANACONDA

from mine to consumer

REG. U.S. PAT. OFF.

RODS WIRE SHEETS

MEMORANDA

YELLOW BRASS RODS

Pounds Per Linear Foot

Sizes—Inches	Round	Hexagon	Square
1/32	.002835	.003126	.003609
1/16	.01130	.01246	.01439
3/32	.02546	.02807	.03241
1/8	.04521	.04985	.05756
5/32	.07068	.07794	.09000
3/16	.1017	.1122	.1295
7/32	.1385	.1527	.1764
1/4	.1808	.1994	.2303
9/32	.2290	.2525	.2915
5/16	.2826	.3116	.3598
11/32	.3420	.3771	.4354
3/8	.4069	.4487	.5181
13/32	.4776	.5267	.6082
7/16	.5538	.6107	.7051
15/32	.6359	.7012	.8096
1/2	.7234	.7976	.9210
17/32	.8167	.9006	1.040
9/16	.9155	1.009	1.166
19/32	1.020	1.125	1.299
5/8	1.130	1.246	1.439
21/32	1.246	1.374	1.587
11/16	1.368	1.508	1.741
23/32	1.495	1.648	1.903
3/4	1.628	1.795	2.072
25/32	1.766	1.948	2.249
13/16	1.910	2.106	2.432
27/32	2.060	2.272	2.623
7/8	2.215	2.443	2.821

Sizes = Diameters or distances between parallel faces.

To determine the weight of Hardware Bronze Rods, multiply the above figures by 1.0326.

To determine the weight of Octagon Rods, multiply weight of a Round Rod of equal diameter by 1.0548.

Variations from these weights must be expected in practice.

YELLOW BRASS RODS

Pounds Per Linear Foot

Sizes—Inches	Round	Hexagon	Square
29/32	2.377	2.621	3.026
15/16	2.543	2.804	3.238
31/32	2.716	2.994	3.458
1	2.893	3.190	3.684
1 1/16	3.266	3.602	4.159
1 1/8	3.662	4.038	4.663
1 3/16	4.080	4.499	5.195
1 1/4	4.521	4.985	5.756
1 5/16	4.984	5.496	6.346
1 3/8	5.470	6.032	6.965
1 7/16	5.979	6.593	7.613
1 1/2	6.510	7.178	8.289
1 9/16	7.064	7.789	8.994
1 5/8	7.640	8.425	9.728
1 11/16	8.239	9.085	10.49
1 3/4	8.861	9.771	11.28
1 13/16	9.505	10.48	12.10
1 7/8	10.17	11.22	12.95
1 15/16	10.86	11.98	13.83
2	11.57	12.76	14.74
2 1/8	13.07	14.41	16.64
2 1/4	14.65	16.15	18.65
2 3/8	16.32	18.00	20.78
2 1/2	18.08	19.94	23.03
2 5/8	19.94	21.98	25.39
2 3/4	21.88	24.13	27.86
2 7/8	23.92	26.37	30.45
3	26.04	28.71	33.16

Sizes = Diameters or distances between parallel faces.

To determine the weight of Hardware Bronze Rods, multiply the above figures by 1.0326.

To determine the weight of Octagon Rods, multiply weight of a Round Rod of equal diameter by 1.0548.

Variations from these weights must be expected in practice.

TOBIN BRONZE RODS
Pounds Per Linear Foot

Sizes—Inches	Round	Hexagon	Square
1/16	.01119	.01234	.01425
1/8	.04477	.04936	.05700
3/16	.1007	.1111	.1282
1/4	.1791	.1975	.2280
5/16	.2798	.3085	.3562
3/8	.4029	.4443	.5130
7/16	.5484	.6047	.6982
1/2	.7163	.7898	.9120
9/16	.9065	.9996	1.154
5/8	1.119	1.234	1.425
11/16	1.354	1.493	1.724
3/4	1.612	1.777	2.052
13/16	1.891	2.086	2.408
7/8	2.194	2.419	2.793
15/16	2.518	2.777	3.206
1	2.865	3.159	3.648
1 1/16	3.234	3.566	4.118
1 1/8	3.626	3.998	4.617
1 3/16	4.040	4.455	5.144
1 1/4	4.477	4.936	5.700
1 5/16	4.936	5.442	6.284
1 3/8	5.417	5.973	6.897
1 7/16	5.921	6.528	7.538
1 1/2	6.447	7.108	8.208
1 9/16	6.995	7.713	8.906
1 5/8	7.566	8.342	9.633
1 11/16	8.159	8.996	10.39
1 3/4	8.774	9.675	11.17
1 13/16	9.412	10.38	11.98
1 7/8	10.07	11.11	12.82
1 15/16	10.76	11.86	13.69
2	11.46	12.64	14.59
2 1/8	12.94	14.27	16.47
2 1/4	14.50	15.99	18.47
2 3/8	16.16	17.82	20.58
2 1/2	17.91	19.75	22.80
2 5/8	19.74	21.77	25.14
2 3/4	21.67	23.89	27.59
2 7/8	23.68	26.11	30.15
3	25.79	28.43	32.83
3 1/4	30.26	33.37	38.53
3 1/2	35.10	38.70	44.69
3 3/4	40.29	44.43	51.30
4	45.84	50.55	58.37
4 1/4	51.75	57.06	65.89
4 1/2	58.02	63.98	73.87
4 3/4	64.64	71.28	82.31
5	71.63	78.98	91.20
5 1/4	78.97	87.08	100.5
5 1/2	86.67	95.57	110.4
5 3/4	94.73	104.5	120.6

Sizes = Diameters or distances between parallel faces.

To determine the weight of Octagon Rods multiply weight of a Round Rod of equal diameter by 1.0548.

Variations from these weights must be expected in practice.

PHOSPHOR BRONZE-610 RODS

(Special Free Cutting)

Pounds Per Linear Foot

Sizes Inches	Round	Square	Sizes Inches	Round	Square
1/32	.002955	.003762	25/32	1.841	2.344
1/16	.01178	.01500	13/16	1.991	2.535
3/32	.02654	.03379	27/32	2.147	2.734
1/8	.04712	.06000	7/8	2.309	2.940
5/32	.07368	.09381	29/32	2.477	3.154
3/16	.1060	.1350	15/16	2.651	3.375
7/32	.1444	.1838	31/32	2.831	3.604
1/4	.1885	.2400	1	3.016	3.840
9/32	.2386	.3039	1 1/16	3.405	4.335
5/16	.2945	.3750	1 1/8	3.817	4.860
11/32	.3565	.4539	1 3/16	4.253	5.415
3/8	.4241	.5400	1 1/4	4.712	6.000
13/32	.4979	.6339	1 5/16	5.195	6.615
7/16	.5773	.7350	1 3/8	5.702	7.260
15/32	.6628	.8439	1 7/16	6.232	7.935
1/2	.7540	.9600	1 1/2	6.786	8.640
17/32	.8513	1.084	1 9/16	7.363	9.375
9/16	.9543	1.215	1 5/8	7.964	10.14
19/32	1.063	1.354	1 11/16	8.588	10.93
5/8	1.178	1.500	1 3/4	9.236	11.76
21/32	1.299	1.654	1 13/16	9.908	12.61
11/16	1.425	1.815	1 7/8	10.60	13.50
23/32	1.558	1.984	1 15/16	11.32	14.41
3/4	1.696	2.160	2	12.06	15.36

Sizes = Diameters or distances between parallel faces.

To determine the weight of a Hexagon or Octagon Rod, multiply weight of a Round Rod of equal diameter by:

1.1027 for Hexagon 1.0548 for Octagon

To determine the weight of Rods for other alloys, multiply the above weights by the following factors:

5% Phosphor Bronze-979 (Leaded) 1.0063
8% Phosphor Bronze-353 ..... .9938
10% Phosphor Bronze-354 ..... .9906

Weights for 5% Phosphor Bronze-351 are same as for Phosphor Bronze-610.

Variations from these weights must be expected in practice.

EVERDUR-1010 RODS

Pounds Per Linear Foot

Sizes—Inches	Round	Hexagon	Square
1/16	.01134	.01250	.01444
1/8	.04536	.05001	.05775
3/16	.1021	.1125	.1299
1/4	.1814	.2001	.2310
5/16	.2835	.3126	.3609
3/8	.4082	.4501	.5198
7/16	.5556	.6127	.7074
1/2	.7257	.8002	.9240
9/16	.9185	1.013	1.169
5/8	1.134	1.250	1.444
11/16	1.372	1.513	1.747
3/4	1.633	1.800	2.079
13/16	1.916	2.113	2.440
7/8	2.222	2.451	2.830
15/16	2.551	2.813	3.248
1	2.903	3.201	3.696
1 1/16	3.277	3.613	4.172
1 1/8	3.674	4.051	4.678
1 3/16	4.093	4.514	5.212
1 1/4	4.536	5.001	5.775
1 5/16	5.001	5.514	6.367
1 3/8	5.488	6.052	6.988
1 7/16	5.998	6.614	7.637
1 1/2	6.531	7.202	8.316
1 9/16	7.087	7.815	9.023
1 5/8	7.665	8.452	9.760

Sizes = Diameters or distances between parallel faces.

To determine the weight of Octagon Rods multiply weight of a Round Rod of equal diameter by 1.0548.

Weights for Everdur-1012 are the same as for Everdur-1010.

To determine the weight of Everdur-1015 Rods, multiply the above weights by the following factor:

Everdur-1015
1.0260

Variations from these weights must be expected in practice.

EVERDUR-1010 RODS

Pounds Per Linear Foot

Sizes—Inches	Round	Hexagon	Square
1 11/16	8.266	9.115	10.52
1 3/4	8.890	9.803	11.32
1 13/16	9.536	10.52	12.14
1 7/8	10.21	11.25	12.99
1 15/16	10.90	12.02	13.87
2	11.61	12.80	14.78
2 1/8	13.11	14.45	16.69
2 1/4	14.70	16.20	18.71
2 3/8	16.37	18.05	20.85
2 1/2	18.14	20.01	23.10
2 5/8	20.00	22.06	25.47
2 3/4	21.95	24.21	27.95
2 7/8	23.99	26.46	30.55
3	26.13	28.81	33.26
3 1/4	30.66	33.81	39.04
3 1/2	35.56	39.21	45.28
3 3/4	40.82	45.01	51.98
4	46.45	51.21	59.14
4 1/4	52.43	57.81	66.76
4 1/2	58.78	64.82	74.84
4 3/4	65.50	72.22	83.39
5	72.57	80.02	92.40
5 1/4	80.01	88.22	101.9
5 1/2	87.81	96.83	111.8
5 3/4	95.97	105.8	122.2
6	104.5	115.2	133.1

Sizes = Diameters or distances between parallel faces.

To determine the weight of Octagon Rods multiply weight of a Round Rod of equal diameter by 1.0548.

Weights for Everdur-1012 are the same as for Everdur-1010.

To determine the weight of Everdur-1015 Rods, multiply the above weights by the following factor:

Everdur-1015
1.0260

Variations from these weights must be expected in practice.

COPPER RODS
Pounds Per Linear Foot

Sizes—Inches	Round	Hexagon	Square
1/16	.01185	.01307	.01509
1/8	.04742	.05229	.06038
3/16	.1067	.1176	.1358
1/4	.1897	.2091	.2415
5/16	.2964	.3268	.3773
3/8	.4268	.4706	.5434
7/16	.5809	.6405	.7396
1/2	.7587	.8366	.9660
9/16	.9602	1.059	1.223
5/8	1.185	1.307	1.509
11/16	1.434	1.582	1.826
3/4	1.707	1.882	2.174
13/16	2.003	2.209	2.551
7/8	2.324	2.562	2.958
15/16	2.667	2.941	3.396
1	3.035	3.346	3.864
1 1/16	3.426	3.778	4.362
1 1/8	3.841	4.235	4.890
1 3/16	4.279	4.719	5.449
1 1/4	4.742	5.229	6.038
1 5/16	5.228	5.765	6.656
1 3/8	5.738	6.327	7.305
1 7/16	6.271	6.915	7.985
1 1/2	6.828	7.529	8.694
1 9/16	7.409	8.170	9.434
1 5/8	8.014	8.836	10.20
1 11/16	8.642	9.529	11.00
1 3/4	9.294	10.25	11.83
1 13/16	9.970	10.99	12.69
1 7/8	10.67	11.76	13.58
1 15/16	11.39	12.56	14.51
2	12.14	13.39	15.46
2 1/8	13.70	15.11	17.45
2 1/4	15.36	16.94	19.56
2 3/8	17.12	18.88	21.80
2 1/2	18.97	20.91	24.15
2 5/8	20.91	23.06	26.63
2 3/4	22.95	25.31	29.22
2 7/8	25.08	27.66	31.94
3	27.31	30.12	34.78
3 1/4	32.05	35.35	40.81
3 1/2	37.18	40.99	47.33
3 3/4	42.68	47.06	54.34
4	48.56	53.54	61.82
4 1/4	54.82	60.44	69.79
4 1/2	61.45	67.76	78.25
4 3/4	68.47	75.50	87.18
5	75.87	83.66	96.60
5 1/4	83.65	92.23	106.5
5 1/2	91.80	101.2	116.9
5 3/4	100.3	110.6	127.8
6	109.3	120.5	139.1

Sizes = Diameters or distances between parallel faces.

To determine the weight of Octagon Rods, multiply weight of a Round Rod of equal diameter by 1.0548.

Variations from these weights must be expected in practice.

RECTANGULAR COPPER BARS

Pounds Per Linear Foot

Widths	Thickness—in Inches			
Inches	1/16	1/8	3/16	1/4
1/2	.1208	.2415	.3623	.4830
5/8	.1509	.3019	.4528	.6038
3/4	.1811	.3623	.5434	.7245
7/8	.2113	.4226	.6339	.8453
1	.2415	.4830	.7245	.9660
1 1/4	.3019	.6038	.9056	1.208
1 1/2	.3623	.7245	1.087	1.449
1 3/4	.4226	.8453	1.268	1.691
2	.4830	.9660	1.449	1.932
2 1/4	.5434	1.087	1.630	2.174
2 1/2	.6038	1.208	1.811	2.415
2 3/4	.6641	1.328	1.992	2.657
3	.7245	1.449	2.174	2.898
3 1/4	.7849	1.570	2.355	3.140
3 1/2	.8453	1.691	2.536	3.381
3 3/4	.9056	1.811	2.717	3.623
4	.9660	1.932	2.898	3.864
4 1/4	1.026	2.053	3.079	4.106
4 1/2	1.087	2.174	3.260	4.347
4 3/4	1.147	2.294	3.441	4.589
5	1.208	2.415	3.623	4.830
5 1/4	1.268	2.536	3.804	5.072
5 1/2	1.328	2.657	3.985	5.313
5 3/4	1.389	2.777	4.166	5.555
6	1.449	2.898	4.347	5.796
	3/8	1/2	3/4	1
1	1.449	1.932	2.898	3.864
1 1/4	1.811	2.415	3.623	4.830
1 1/2	2.174	2.898	4.347	5.796
1 3/4	2.536	3.381	5.072	6.762
2	2.898	3.864	5.796	7.728
2 1/4	3.260	4.347	6.521	8.694
2 1/2	3.623	4.830	7.245	9.660
2 3/4	3.985	5.313	7.970	10.63
3	4.347	5.796	8.694	11.59
3 1/4	4.709	6.279	9.419	12.56
3 1/2	5.072	6.762	10.14	13.52
3 3/4	5.434	7.245	10.87	14.49
4	5.796	7.728	11.59	15.46
4 1/4	6.158	8.211	12.32	16.42
4 1/2	6.521	8.694	13.04	17.39
4 3/4	6.883	9.177	13.77	18.35
5	7.245	9.660	14.49	19.32
5 1/4	7.607	10.14	15.21	20.29
5 1/2	7.970	10.63	15.94	21.25
5 3/4	8.332	11.11	16.66	22.22
6	8.694	11.59	17.39	23.18

Variations from these weights must be expected in practice.

18% NICKEL SILVER-719 RODS

Pounds Per Linear Foot

Diameters Inches	Round	Hexagon	Square
1/32	.002918	.003217	.003715
1/16	.01163	.01283	.01481
3/32	.02620	.02889	.03336
1/8	.04653	.05131	.05925
5/32	.07276	.08023	.09264
3/16	.1047	.1155	.1333
7/32	.1426	.1572	.1815
1/4	.1861	.2052	.2370
9/32	.2357	.2599	.3001
5/16	.2908	.3207	.3703
11/32	.3520	.3882	.4482
3/8	.4188	.4618	.5333
13/32	.4916	.5421	.6260
7/16	.5701	.6286	.7258
15/32	.6545	.7217	.8334
1/2	.7446	.8210	.9480
17/32	.8407	.9270	1.070
9/16	.9423	1.039	1.200
19/32	1.050	1.158	1.337
5/8	1.163	1.283	1.481
21/32	1.283	1.415	1.633
11/16	1.408	1.552	1.792
23/32	1.539	1.697	1.959
3/4	1.675	1.847	2.133
25/32	1.818	2.005	2.315
13/16	1.966	2.168	2.503
27/32	2.120	2.338	2.700
7/8	2.280	2.514	2.903

To determine the weight of Octagon Rods multiply weight of a Round Rod of equal diameter by 1.0548.

Weights for 20% and 30% Ambrac Rods—use same weights as for Phosphor Bronze Rods.

To determine the weight of Rods for other grades of Nickel Silver, multiply the above weights by the following factors:

10% Nickel Silver-823 (Extruded, Leaded)	12% Nickel Silver-796 (Leaded)	18% Nickel Silver-789 (Leaded)
.9684	.9937	1.0032

Variations from these weights must be expected in practice.

18% NICKEL SILVER-719 RODS

Pounds Per Linear Foot

Diameters Inches	Round	Hexagon	Square
29/32	2.446	2.697	3.115
15/16	2.618	2.886	3.333
31/32	2.795	3.082	3.559
1	2.978	3.284	3.792
1 1/16	3.362	3.707	4.281
1 1/8	3.769	4.156	4.799
1 3/16	4.200	4.631	5.347
1 1/4	4.653	5.131	5.925
1 5/16	5.130	5.657	6.532
1 3/8	5.631	6.209	7.169
1 7/16	6.154	6.786	7.836
1 1/2	6.701	7.389	8.532
1 9/16	7.271	8.017	9.258
1 5/8	7.864	8.672	10.01
1 11/16	8.481	9.352	10.80
1 3/4	9.121	10.06	11.61
1 13/16	9.784	10.79	12.46
1 7/8	10.47	11.55	13.33
1 15/16	11.18	12.33	14.23
2	11.91	13.14	15.17
2 1/8	13.45	14.83	17.12
2 1/4	15.08	16.63	19.20
2 3/8	16.80	18.52	21.39
2 1/2	18.61	20.52	23.70
2 5/8	20.52	22.63	26.13
2 3/4	22.52	24.84	28.68
2 7/8	24.62	27.14	31.34
3	26.80	29.56	34.13

To determine the weight of Octagon Rods multiply weight of a Round Rod of equal diameter by 1.0548.

Weights for 20% and 30% Ambrac Rods—use same weights as for Phosphor Bronze Rods.

To determine the weight of Rods for other grades of Nickel Silver, multiply the above weights by the following factors:

10% Nickel Silver-823 (Extruded, Leaded)	12% Nickel Silver-796 (Leaded)	18% Nickel Silver-789 (Leaded)
.9684	.9937	1.0032

Variations from these weights must be expected in practice.

ANACONDA YELLOW BRASS RODS

Pounds Per Thousand Pieces

The weight tables given on the following pages have been prepared to assist the Estimator on Screw Machine Products in determining the theoretical weights of rod stock required for a given job.

Weights are shown for various diameters and in lengths of from 1/16″ to 2″ inclusive and give the amount of stock required, in pounds per 1,000 pieces, with no allowance made for cutting. By adding the width of the saw cut to the length, the total weight may be obtained.

Although the figures given in the tables cover theoretical weights for Anaconda Free Cutting Yellow Brass Rods only, factors are given for adjusting these weights to other commercial alloys. Additional factors for unlisted alloys will be furnished upon request.

To determine the weight of other than Yellow Brass Rods, multiply the weight appearing in subsequent pages by the factors shown below:

Leaded Alloys

Leaded Tobin Bronze	.9902
Leaded Naval Brass	.9902
Leaded 10% Nickel Silver-823	.9967
Leaded 12% Nickel Silver-796	1.0228
Leaded 18% Nickel Silver-789	1.0326
Everdur-1012	1.0033
Hardware Bronze-267	1.0326
Leaded Commercial Bronze-202	1.0391
Phosphor Bronze-610 (Special Free Cutting)	1.0423
Leaded 5% Phosphor Bronze-979	1.0489
Leaded Copper-946	1.0521

Non-Leaded Alloys

Tobin Bronze	.9902
Naval Brass	.9902
Everdur-1010	1.0033
18% Nickel Silver-719	1.0293
Commercial Bronze-90%	1.0358
Copper	1.0489

To find the weight of Hexagon, Octagon and Square Rods, multiply the weight of a Round Rod of the same diameter by:

Hexagon—1.1027 **Octagon—1.0548** **Square—1.2732**

ROUND YELLOW BRASS RODS

Pounds Per 1,000 Pieces

Diameters	Lengths—in Inches				
Inches	1/16	1/8	3/16	1/4	5/16
1/16	.05887	.1177	.1766	.2355	.2943
3/32	.1324	.2649	.3974	.5298	.6622
1/8	.2355	.4709	.7064	.9419	1.177
5/32	.3679	.7358	1.104	1.472	1.840
3/16	.5298	1.060	1.589	2.119	2.649
7/32	.7211	1.442	2.163	2.884	3.606
1/4	.9419	1.884	2.826	3.767	4.709
9/32	1.192	2.384	3.576	4.768	5.960
5/16	1.472	2.943	4.415	5.887	7.358
11/32	1.781	3.561	5.342	7.123	8.904
3/8	2.119	4.238	6.358	8.477	10.60
13/32	2.487	4.974	7.461	9.948	12.44
7/16	2.884	5.769	8.653	11.54	14.42
15/32	3.311	6.622	9.934	13.24	16.56
1/2	3.767	7.535	11.30	15.07	18.84
17/32	4.253	8.506	12.76	17.01	21.27
9/16	4.768	9.536	14.30	19.07	23.84
19/32	5.313	10.63	15.94	21.25	26.56
5/8	5.887	11.77	17.66	23.55	29.43
21/32	6.490	12.98	19.47	25.96	32.45
11/16	7.123	14.25	21.37	28.49	35.61
23/32	7.785	15.57	23.36	31.14	38.93
3/4	8.477	16.95	25.43	33.91	42.38
25/32	9.198	18.40	27.59	36.79	45.99
13/16	9.948	19.90	29.85	39.79	49.74
27/32	10.73	21.46	32.19	42.91	53.64
7/8	11.54	23.08	34.61	46.15	57.69
29/32	12.38	24.75	37.13	49.51	61.88
15/16	13.24	26.49	39.74	52.98	66.22
31/32	14.14	28.29	42.43	56.57	70.71
1	15.07	30.14	45.21	60.28	75.35
1 1/16	17.01	34.03	51.04	68.05	85.06
1 1/8	19.07	38.15	57.22	76.29	95.36
1 3/16	21.25	42.50	63.75	85.00	106.3
1 1/4	23.55	47.09	70.64	94.19	117.7
1 5/16	25.96	51.92	77.88	103.8	129.8
1 3/8	28.49	56.98	85.47	114.0	142.5
1 7/16	31.14	62.28	93.42	124.6	155.7
1 1/2	33.91	67.81	101.7	135.6	169.5
1 9/16	36.79	73.58	110.4	147.2	184.0
1 5/8	39.79	79.59	119.4	159.2	199.0
1 11/16	42.91	85.83	128.7	171.7	214.6
1 3/4	46.15	92.30	138.5	184.6	230.8
1 13/16	49.51	99.01	148.5	198.0	247.5
1 7/8	52.98	106.0	158.9	211.9	264.9
1 15/16	56.57	113.1	169.7	226.3	282.9
2	60.28	120.6	180.8	241.1	301.4

Variations from these weights must be expected in practice.

ROUND YELLOW BRASS RODS

Pounds Per 1,000 Pieces

Diameters	Lengths—in Inches				
Inches	3/8	7/16	1/2	9/16	5/8
1/16	.3532	.4121	.4709	.5298	.5887
3/32	.7947	.9271	1.060	1.192	1.324
1/8	1.413	1.648	1.884	2.119	2.355
5/32	2.207	2.575	2.943	3.311	3.679
3/16	3.179	3.709	4.238	4.768	5.298
7/32	4.327	5.048	5.769	6.490	7.211
1/4	5.651	6.593	7.535	8.477	9.419
9/32	7.152	8.344	9.536	10.73	11.92
5/16	8.830	10.30	11.77	13.24	14.72
11/32	10.68	12.46	14.25	16.03	17.81
3/8	12.72	14.83	16.95	19.07	21.19
13/32	14.92	17.41	19.90	22.38	24.87
7/16	17.31	20.19	23.08	25.96	28.84
15/32	19.87	23.18	26.49	29.80	33.11
1/2	22.60	26.37	30.14	33.91	37.67
17/32	25.52	29.77	34.03	38.28	42.53
9/16	28.61	33.38	38.15	42.91	47.68
19/32	31.88	37.19	42.50	47.81	53.13
5/8	35.32	41.21	47.09	52.98	58.87
21/32	38.94	45.43	51.92	58.41	64.90
11/16	42.74	49.86	56.98	64.11	71.23
23/32	46.71	54.50	62.28	70.07	77.85
3/4	50.86	59.34	67.81	76.29	84.77
25/32	55.19	64.39	73.58	82.78	91.98
13/16	59.69	69.64	79.59	89.54	99.48
27/32	64.37	75.10	85.83	96.56	107.3
7/8	69.23	80.76	92.30	103.8	115.4
29/32	74.26	86.64	99.01	111.4	123.8
15/16	79.47	92.71	106.0	119.2	132.4
31/32	84.86	99.00	113.1	127.3	141.4
1	90.42	105.5	120.6	135.6	150.7
1 1/16	102.1	119.1	136.1	153.1	170.1
1 1/8	114.4	133.5	152.6	171.7	190.7
1 3/16	127.5	148.8	170.0	191.3	212.5
1 1/4	141.3	164.8	188.4	211.9	235.5
1 5/16	155.8	181.7	207.7	233.6	259.6
1 3/8	170.9	199.4	227.9	256.4	284.9
1 7/16	186.8	218.0	249.1	280.3	311.4
1 1/2	203.4	237.4	271.3	305.2	339.1
1 9/16	220.7	257.5	294.3	331.1	367.9
1 5/8	238.8	278.6	318.4	358.1	397.9
1 11/16	257.5	300.4	343.3	386.2	429.1
1 3/4	276.9	323.1	369.2	415.4	461.5
1 13/16	297.0	346.5	396.1	445.6	495.1
1 7/8	317.9	370.9	423.8	476.8	529.8
1 15/16	339.4	396.0	452.6	509.1	565.7
2	361.7	422.0	482.2	542.5	602.8

Variations from these weights must be expected in practice.

ROUND YELLOW BRASS RODS

Pounds Per 1,000 Pieces

Diameters	Lengths—in Inches					
Inches	11/16	3/4	13/16	7/8	15/16	1
1/16	.6475	.7064	.7653	.8241	.8830	.9419
3/32	1.457	1.589	1.722	1.854	1.987	2.119
1/8	2.590	2.826	3.061	3.297	3.532	3.767
5/32	4.047	4.415	4.783	5.151	5.519	5.887
3/16	5.828	6.358	6.887	7.417	7.947	8.477
7/32	7.932	8.653	9.375	10.10	10.82	11.54
1/4	10.36	11.30	12.24	13.19	14.13	15.07
9/32	13.11	14.30	15.50	16.69	17.88	19.07
5/16	16.19	17.66	19.13	20.60	22.07	23.55
11/32	19.59	21.37	23.15	24.93	26.71	28.49
3/8	23.31	25.43	27.55	29.67	31.79	33.91
13/32	27.36	29.85	32.33	34.82	37.31	39.79
7/16	31.73	34.61	37.50	40.38	43.27	46.15
15/32	36.42	39.74	43.05	46.36	49.67	52.98
1/2	41.44	45.21	48.98	52.74	56.51	60.28
17/32	46.78	51.04	55.29	59.54	63.80	68.05
9/16	52.45	57.22	61.99	66.75	71.52	76.29
19/32	58.44	63.75	69.06	74.38	79.69	85.00
5/8	64.75	70.64	76.53	82.41	88.30	94.19
21/32	71.39	77.88	84.37	90.86	97.35	103.8
11/16	78.35	85.47	92.60	99.72	106.8	114.0
23/32	85.64	93.42	101.2	109.0	116.8	124.6
3/4	93.24	101.7	110.2	118.7	127.2	135.6
25/32	101.2	110.4	119.6	128.8	138.0	147.2
13/16	109.4	119.4	129.3	139.3	149.2	159.2
27/32	118.0	128.7	139.5	150.2	160.9	171.7
7/8	126.9	138.5	150.0	161.5	173.1	184.6
29/32	136.1	148.5	160.9	173.3	185.7	198.0
15/16	145.7	158.9	172.2	185.4	198.7	211.9
31/32	155.6	169.7	183.9	198.0	212.1	226.3
1	165.8	180.8	195.9	211.0	226.0	241.1
1 1/16	187.1	204.1	221.2	238.2	255.2	272.2
1 1/8	209.8	228.9	247.9	267.0	286.1	305.2
1 3/16	233.8	255.0	276.3	297.5	318.8	340.0
1 1/4	259.0	282.6	306.1	329.7	353.2	376.7
1 5/16	285.6	311.5	337.5	363.4	389.4	415.4
1 3/8	313.4	341.9	370.4	398.9	427.4	455.9
1 7/16	342.5	373.7	404.8	436.0	467.1	498.2
1 1/2	373.0	406.9	440.8	474.7	508.6	542.5
1 9/16	404.7	441.5	478.3	515.1	551.9	588.7
1 5/8	437.7	477.5	517.3	557.1	596.9	636.7
1 11/16	472.1	515.0	557.9	600.8	643.7	686.6
1 3/4	507.7	553.8	600.0	646.1	692.3	738.4
1 13/16	544.6	594.1	643.6	693.1	742.6	792.1
1 7/8	582.8	635.8	688.7	741.7	794.7	847.7
1 15/16	622.3	678.8	735.4	792.0	848.6	905.1
2	663.1	723.4	783.6	843.9	904.2	964.5

Variations from these weights must be expected in practice.

ROUND YELLOW BRASS RODS

Pounds Per 1,000 Pieces

Diameters	Lengths—in Inches					
Inches	1 1/16	1 1/8	1 3/16	1 1/4	1 5/16	1 3/8
1/16	1.001	1.060	1.118	1.177	1.236	1.295
3/32	2.252	2.384	2.517	2.649	2.781	2.914
1/8	4.003	4.238	4.474	4.709	4.945	5.180
5/32	6.255	6.623	6.990	7.358	7.726	8.094
3/16	9.007	9.536	10.07	10.60	11.13	11.66
7/32	12.26	12.98	13.70	14.42	15.14	15.86
1/4	16.01	16.95	17.90	18.84	19.78	20.72
9/32	20.26	21.46	22.65	23.84	25.03	26.23
5/16	25.02	26.49	27.96	29.43	30.91	32.38
11/32	30.27	32.05	33.83	35.61	37.40	39.18
3/8	36.03	38.15	40.26	42.38	44.50	46.62
13/32	42.28	44.77	47.25	49.74	52.23	54.72
7/16	49.04	51.92	54.80	57.69	60.57	63.46
15/32	56.29	59.60	62.91	66.22	69.54	72.85
1/2	64.05	67.81	71.58	75.35	79.12	82.88
17/32	72.30	76.56	80.81	85.06	89.32	93.57
9/16	81.06	85.83	90.60	95.36	100.1	104.9
19/32	90.32	95.63	100.9	106.3	111.6	116.9
5/8	100.1	106.0	111.8	117.7	123.6	129.5
21/32	110.3	116.8	123.3	129.8	136.3	142.8
11/16	121.1	128.2	135.3	142.5	149.6	156.7
23/32	132.3	140.1	147.9	155.7	163.5	171.3
3/4	144.1	152.6	161.1	169.5	178.0	186.5
25/32	156.4	165.6	174.8	184.0	193.2	202.4
13/16	169.1	179.1	189.0	199.0	208.9	218.9
27/32	182.4	193.1	203.8	214.6	225.3	236.0
7/8	196.1	207.7	219.2	230.8	242.3	253.8
29/32	210.4	222.8	235.2	247.5	259.9	272.3
15/16	225.2	238.4	251.7	264.9	278.1	291.4
31/32	240.4	254.6	268.7	282.9	297.0	311.1
1	256.2	271.3	286.3	301.4	316.5	331.5
1 1/16	289.2	306.2	323.2	340.3	357.3	374.3
1 1/8	324.2	343.3	362.4	381.5	400.5	419.6
1 3/16	361.3	382.5	403.8	425.0	446.3	467.5
1 1/4	400.3	423.8	447.4	470.9	494.5	518.0
1 5/16	441.3	467.3	493.2	519.2	545.2	571.1
1 3/8	484.4	512.8	541.3	569.8	598.3	626.8
1 7/16	529.4	560.5	591.7	622.8	653.9	685.1
1 1/2	576.4	610.3	644.2	678.1	712.0	746.0
1 9/16	625.5	662.3	699.0	735.8	772.6	809.4
1 5/8	676.5	716.3	756.1	795.9	835.7	875.5
1 11/16	729.5	772.4	815.4	858.3	901.2	944.1
1 3/4	784.6	830.7	876.9	923.0	969.2	1015.
1 13/16	841.6	891.1	940.6	990.1	1040.	1089.
1 7/8	900.7	953.6	1007.	1060.	1113.	1166.
1 15/16	961.7	1018.	1075.	1131.	1188.	1245.
2	1025.	1085.	1145.	1206.	1266.	1326.

Variations from these weights must be expected in practice.

ROUND YELLOW BRASS RODS

Pounds Per 1,000 Pieces

Diameters	Lengths—in Inches				
Inches	1 7/16	1 1/2	1 9/16	1 5/8	1 11/16
1/16	1.354	1.413	1.472	1.531	1.589
3/32	3.046	3.179	3.311	3.444	3.576
1/8	5.416	5.651	5.887	6.122	6.358
5/32	8.462	8.830	9.198	9.566	9.934
3/16	12.19	12.72	13.24	13.77	14.30
7/32	16.59	17.31	18.03	18.75	19.47
1/4	21.66	22.60	23.55	24.49	25.43
9/32	27.42	28.61	29.80	30.99	32.19
5/16	33.85	35.32	36.79	38.26	39.74
11/32	40.96	42.74	44.52	46.30	48.08
3/8	48.74	50.86	52.98	55.10	57.22
13/32	57.20	59.69	62.18	64.66	67.15
7/16	66.34	69.23	72.11	75.00	77.88
15/32	76.16	79.47	82.78	86.09	89.40
1/2	86.65	90.42	94.19	97.95	101.7
17/32	97.82	102.1	106.3	110.6	114.8
9/16	109.7	114.4	119.2	124.0	128.7
19/32	122.2	127.5	132.8	138.1	143.4
5/8	135.4	141.3	147.2	153.1	158.9
21/32	149.3	155.8	162.3	168.7	175.2
11/16	163.8	170.9	178.1	185.2	192.3
23/32	179.1	186.8	194.6	202.4	210.2
3/4	195.0	203.4	211.9	220.4	228.9
25/32	211.6	220.7	229.9	239.1	248.3
13/16	228.8	238.8	248.7	258.7	268.6
27/32	246.8	257.5	268.2	278.9	289.7
7/8	265.4	276.9	288.4	300.0	311.5
29/32	284.7	297.0	309.4	321.8	334.2
15/16	304.6	317.9	331.1	344.4	357.6
31/32	325.3	339.4	353.6	367.7	381.9
1	346.6	361.7	376.7	391.8	406.9
1 1/16	391.3	408.3	425.3	442.3	459.3
1 1/8	438.7	457.7	476.8	495.9	515.0
1 3/16	488.8	510.0	531.3	552.5	573.8
1 1/4	541.6	565.1	588.7	612.2	635.8
1 5/16	597.1	623.0	649.0	675.0	700.9
1 3/8	655.3	683.8	712.3	740.8	769.3
1 7/16	716.2	747.4	778.5	809.6	840.8
1 1/2	779.9	813.8	847.7	881.6	915.5
1 9/16	846.2	883.0	919.8	956.6	993.4
1 5/8	915.3	955.1	994.8	1035.	1074.
1 11/16	987.0	1030.	1073.	1116.	1159.
1 3/4	1061.	1108.	1154.	1200.	1246.
1 13/16	1139.	1188.	1238.	1287.	1337.
1 7/8	1219.	1272.	1324.	1377.	1430.
1 15/16	1301.	1358.	1414.	1471.	1527.
2	1386.	1447.	1507.	1567.	1628.

Variations from these weights must be expected in practice.

ROUND YELLOW BRASS RODS

Pounds Per 1,000 Pieces

Diameters	Lengths—in Inches				
Inches	1¾	1 13/16	1⅞	1 15/16	2
1/16	1.648	1.707	1.766	1.825	1.884
3/32	3.709	3.841	3.974	4.106	4.238
1/8	6.593	6.828	7.064	7.299	7.535
5/32	10.30	10.67	11.04	11.41	11.77
3/16	14.83	15.36	15.89	16.42	16.95
7/32	20.19	20.91	21.63	22.35	23.08
1/4	26.37	27.31	28.26	29.20	30:14
9/32	33.38	34.57	35.76	36.95	38.15
5/16	41.21	42.68	44.15	45.62	47.09
11/32	49.86	51.64	53.42	55.20	56.98
3/8	59.34	61.46	63.58	65.70	67.81
13/32	69.64	72.13	74.61	77.10	79.59
7/16	80.76	83.65	86.53	89.42	92.30
15/32	92.71	96.03	99.34	102.6	106.0
1/2	105.5	109.3	113.0	116.8	120.6
17/32	119.1	123.3	127.6	131.8	136.1
9/16	133.5	138.3	143.0	147.8	152.6
19/32	148.8	154.1	159.4	164.7	170.0
5/8	164.8	170.7	176.6	182.5	188.4
21/32	181.7	188.2	194.7	201.2	207.7
11/16	199.4	206.6	213.7	220.8	227.9
23/32	218.0	225.8	233.6	241.3	249.1
3/4	237.3	245.8	254.3	262.8	271.3
25/32	257.5	266.7	275.9	285.1	294.3
13/16	278.6	288.5	298.5	308.4	318.3
27/32	300.4	311.1	321.9	332.6	343.3
7/8	323.1	334.6	346.1	357.7	369.2
29/32	346.5	358.9	371.3	383.7	396.1
15/16	370.9	384.1	397.4	410.6	423.8
31/32	396.0	410.1	424.3	438.4	452.6
1	422.0	437.0	452.1	467.2	482.2
1 1/16	476.4	493.4	510.4	527.4	544.4
1 1/8	534.0	553.1	572.2	591.3	610.3
1 3/16	595.0	616.3	637.5	658.8	680.0
1¼	659.3	682.8	706.4	729.9	753.5
1 5/16	726.9	752.8	778.8	804.8	830.7
1 3/8	797.8	826.3	854.7	883.2	911.7
1 7/16	871.9	903.1	934.2	965.4	996.5
1½	949.4	983.3	1017.	1051.	1085.
1 9/16	1030.	1067.	1104.	1141.	1177.
1 5/8	1114.	1154.	1194.	1234.	1273.
1 11/16	1202.	1245.	1287.	1330.	1373.
1¾	1292.	1338.	1385.	1431.	1477.
1 13/16	1386.	1436.	1485.	1535.	1584.
1⅞	1483.	1536.	1589.	1642.	1695.
1 15/16	1584.	1641.	1697.	1754.	1810.
2	1688.	1748.	1808.	1869.	1929.

Variations from these weights must be expected in practice.

ANACONDA TUBES

— WEIGHT TABLES —

ANACONDA

from mine to consumer

REG U.S. PAT. OF.

TUBES

DATA

TUBES

RODS

WIRE

SHEETS

MEMORANDA

SEAMLESS TUBE CONVERSION FACTORS

Alloys

To determine the weight of Seamless Tubes of the following alloys, multiply the weights of Yellow Brass Tubes by factors shown below:

Red Brass-80%	-1.0195	Muntz Metal	- .9967
Red Brass-85%	-1.0293	Ambraloy-901	- .9609
Commercial Bronze-90%	-1.0358	Ambraloy-927	- .9805
Ambrac-850	-1.0423	Admiralty	-1.0033
Phosphor Bronze-351	-1.0423	Everdur-1015	-1.0293
		"70 & 30" Brass	-1.0033

Super-Nickel Tubes—use same weight as for Copper Tubes

Diameters

To determine the weight of a Tube of a given I.D., add the following Constants to the weights for O.D. Tubes appearing in subsequent pages.

Stubs' Gauge

Thickness		Constants		Thickness		Constants	
Gauge	Inches	Brass	Copper	Gauge	Inches	Brass	Copper
	.375	3.26	3.42	17	.058	.078	.082
	.328	2.49	2.62	18	.049	.056	.058
1	.300	2.08	2.19	19	.042	.0408	.0430
2	.284	1.87	1.96	20	.035	.0284	.0298
3	.259	1.55	1.63	21	.032	.0237	.0249
4	.238	1.31	1.38	22	.028	.0181	.0191
5	.220	1.12	1.18	23	.025	.0145	.0152
6	.203	.95	1.00	24	.022	.0112	.0118
7	.180	.75	.79	25	.020	.0093	.0097
8	.165	.630	.663	26	.018	.0075	.0079
	.156	.563	.593	27	.016	.0059	.0062
9	.148	.507	.533	28	.014	.0045	.0048
10	.134	.416	.437	29	.013	.0039	.0041
	.125	.362	.381	30	.012	.0033	.0035
11	.120	.333	.351	31	.010	.0023	.0024
12	.109	.275	.289	32	.009	.0019	.0020
13	.095	.209	.220	33	.008	.0015	.0016
14	.083	.159	.168	34	.007	.0011	.0012
15	.072	.120	.126	35	.005	.0006	.0006
16	.065	.098	.103	36	.004	.0004	.0004

General Formulas

To determine the weight in pounds per linear foot of a Seamless Tube size not shown on pages 103-119.

1. When O.D. is given:
   Subtract gauge from O.D.
   Multiply by gauge
   Multiply by—
   11.5736 for Brass
   12.1768 for Copper

2. When I.D. is given:
   Add gauge to I.D.
   Multiply by gauge
   Multiply by—
   11.5736 for Brass
   12.1768 for Copper

The above factors are arrived at by using a density of .307 pounds per cubic inch for Yellow Brass and .323 pounds per cubic inch for Deoxidized Copper.

YELLOW BRASS AND COPPER TUBES

Pounds Per Linear Foot

Stubs' Gauge

Gauges	36		35		34	
Inches	.004		.005		.007	
O. D. Inches	Brass	Copper	Brass	Copper	Brass	Copper
1/16	.0027	.0028	.0033	.0035	.0045	.0047
5/64	.0034	.0036	.0042	.0045	.0058	.0061
3/32	.0042	.0044	.0051	.0054	.0070	.0074
7/64	.0049	.0051	.0060	.0064	.0083	.0087
1/8	.0056	.0059	.0069	.0073	.0096	.0101
5/32	.0071	.0074	.0088	.0092	.0121	.0127
3/16	.0085	.0089	.0106	.0111	.0146	.0154
7/32	.0099	.0105	.0124	.0130	.0172	.0181
1/4	.0114	.0120	.0142	.0149	.0197	.0207
9/32	.0128	.0135	.0160	.0168	.0222	.0234
5/16			.0178	.0187	.0248	.0260
3/8			.0214	.0225	.0298	.0314
7/16			.0250	.0263	.0349	.0367
1/2			.0286	.0301	.0399	.0420
9/16			.0323	.0339	.0450	.0473

Variations from these weights must be expected in practice.

YELLOW BRASS AND COPPER TUBES

Pounds Per Linear Foot

Stubs' Gauge

Gauges	33		32		31	
Inches	.008		.009		.010	
O. D. Inches	Brass	Copper	Brass	Copper	Brass	Copper
1/16	.0050	.0053	.0056	.0059	.0061	.0064
5/64	.0065	.0068	.0072	.0076	.0079	.0083
3/32	.0079	.0084	.0088	.0093	.0097	.0102
7/64	.0094	.0099	.0105	.0110	.0115	.0121
1/8	.0108	.0114	.0121	.0127	.0133	.0140
5/32	.0137	.0144	.0153	.0161	.0169	.0178
3/16	.0166	.0175	.0186	.0196	.0205	.0216
7/32	.0195	.0205	.0219	.0230	.0242	.0254
1/4	.0224	.0236	.0251	.0264	.0278	.0292
9/32	.0253	.0266	.0284	.0298	.0314	.0330
5/16	.0282	.0297	.0316	.0333	.0350	.0368
3/8	.0340	.0358	.0381	.0401	.0422	.0444
7/16	.0398	.0418	.0446	.0470	.0495	.0521
1/2	.0456	.0479	.0511	.0538	.0567	.0597
9/16	.0513	.0540	.0577	.0607	.0639	.0673

Variations from these weights must be expected in practice.

YELLOW BRASS AND COPPER TUBES

Pounds Per Linear Foot

Stubs' Gauge

Gauges	30		29		28	
Inches	.012		.013		.014	
O. D. Inches	Brass	Copper	Brass	Copper	Brass	Copper
1/16	.0070	.0074	.0074	.0078	.0079	.0083
5/64	.0092	.0097	.0098	.0103	.0104	.0109
3/32	.0114	.0120	.0122	.0128	.0129	.0136
7/64	.0135	.0142	.0145	.0153	.0155	.0163
1/8	.0157	.0165	.0169	.0177	.0180	.0189
5/32	.0200	.0211	.0216	.0227	.0231	.0243
3/16	.0244	.0256	.0263	.0276	.0281	.0296
7/32	.0287	.0302	.0310	.0326	.0332	.0349
1/4	.0331	.0348	.0357	.0375	.0382	.0402
9/32	.0374	.0394	.0404	.0425	.0433	.0456
5/16	.0417	.0439	.0451	.0474	.0484	.0509
3/8	.0504	.0530	.0545	.0573	.0585	.0615
7/16	.0591	.0622	.0639	.0672	.0686	.0722
1/2	.0678	.0713	.0733	.0771	.0787	.0829
9/16	.0765	.0804	.0827	.0870	.0889	.0935
5/8	.0851	.0896	.0921	.0969	.0990	.104
3/4	.102	.108	.111	.117	.119	.125
7/8	.120	.126	.130	.136	.140	.147
1	.137	.144	.149	.156	.160	.168

Variations from these weights must be expected in practice.

YELLOW BRASS AND COPPER TUBES

Pounds Per Linear Foot

Stubs' Gauge

Gauges	27		26		25	
Inches	.016		.018		.020	
O. D. Inches	Brass	Copper	Brass	Copper	Brass	Copper
1/16	.0086	.0091	.0093	.0098	.0098	.0104
5/64	.0115	.0121	.0125	.0132	.0134	.0141
3/32	.0144	.0152	.0158	.0166	.0171	.0180
7/64	.0173	.0182	.0190	.0200	.0207	.0218
1/8	.0202	.0212	.0223	.0235	.0243	.0256
5/32	.0260	.0273	.0288	.0303	.0315	.0332
3/16	.0318	.0334	.0353	.0372	.0388	.0408
7/32	.0376	.0395	.0418	.0440	.0460	.0484
1/4	.0433	.0456	.0483	.0509	.0532	.0560
9/32	.0491	.0517	.0549	.0577	.0605	.0636
5/16	.0549	.0578	.0614	.0645	.0677	.0712
3/8	.0665	.0699	.0744	.0782	.0822	.0865
7/16	.0781	.0821	.0874	.0919	.0966	.102
1/2	.0896	.0943	.100	.106	.111	.117
9/16	.101	.106	.113	.119	.126	.132
5/8	.113	.119	.126	.133	.140	.147
3/4	.136	.143	.152	.160	.169	.178
7/8	.159	.167	.179	.188	.198	.208
1	.182	.192	.205	.215	.227	.239
1 1/4					.285	.300
1 1/2					.343	.360
1 3/4					.400	.421
2					.458	.482

Variations from these weights must be expected in practice.

YELLOW BRASS AND COPPER TUBES

Pounds Per Linear Foot

Stubs' Gauges	24		23		22	
Inches	.022		.025		.028	
O. D. Inches	Brass	Copper	Brass	Copper	Brass	Copper
1/16	.0103	.0108	.0109	.0114		
5/64	.0143	.0150	.0154	.0162		
3/32	.0183	.0192	.0199	.0209		
7/64	.0223	.0234	.0244	.0257		
1/8	.0262	.0276	.0289	.0304	.0314	.0331
5/32	.0342	.0360	.0380	.0400	.0416	.0437
3/16	.0421	.0443	.0470	.0495	.0517	.0544
7/32	.0501	.0527	.0561	.0590	.0618	.0651
1/4	.0581	.0611	.0651	.0685	.0719	.0757
9/32	.0660	.0695	.0742	.0780	.0821	.0864
5/16	.0740	.0778	.0832	.0875	.0922	.0970
3/8	.0899	.0946	.101	.107	.112	.118
7/16	.106	.111	.119	.126	.133	.140
1/2	.122	.128	.137	.145	.153	.161
9/16	.138	.145	.156	.164	.173	.182
5/8	.154	.162	.174	.183	.193	.204
3/4	.185	.195	.210	.221	.234	.246
7/8	.217	.229	.246	.259	.274	.289
1	.249	.262	.282	.297	.315	.331
1 1/4	.313	.329	.354	.373	.396	.417
1 1/2	.376	.396	.427	.449	.477	.502
1 3/4	.440	.463	.499	.525	.558	.587
2	.504	.530	.571	.601	.639	.672
2 1/4			.644	.677	.720	.758
2 1/2			.716	.753	.801	.843
2 3/4			.788	.830	.882	.928
3			.861	.906	.963	1.01
3 1/4			.933	.982	1.04	1.10
3 1/2			1.01	1.06	1.13	1.18
3 3/4			1.08	1.13	1.21	1.27
4					1.29	1.35
4 1/4					1.37	1.44
4 1/2					1.45	1.52

Variations from these weights must be expected in practice.

YELLOW BRASS AND COPPER TUBES

Pounds Per Linear Foot

Stubs' Gauges	21		20		19	
Inches	.032		.035		.042	
O. D. Inches	Brass	Copper	Brass	Copper	Brass	Copper
1/8	.0344	.0362	.0365	.0384	.0403	.0424
5/32	.0460	.0484	.0491	.0517	.0556	.0585
3/16	.0576	.0606	.0618	.0650	.0707	.0744
7/32	.0692	.0728	.0745	.0783	.0859	.0904
1/4	.0807	.0849	.0871	.0916	.101	.106
9/32	.0923	.0971	.0998	.105	.116	.122
5/16	.104	.109	.112	.118	.131	.138
3/8	.127	.134	.138	.145	.162	.170
7/16	.150	.158	.163	.172	.192	.202
1/2	.173	.182	.188	.198	.223	.234
9/16	.196	.207	.214	.225	.253	.266
5/8	.220	.231	.239	.251	.283	.298
3/4	.266	.280	.290	.305	.344	.362
7/8	.312	.328	.340	.358	.405	.426
1	.359	.377	.391	.411	.466	.490
1 1/4	.451	.475	.492	.518	.587	.618
1 1/2	.544	.572	.593	.624	.709	.746
1 3/4	.636	.669	.695	.731	.830	.874
2	.729	.767	.796	.837	.952	1.00
2 1/4	.821	.864	.897	.944	1.07	1.13
2 1/2	.914	.962	.999	1.05	1.19	1.26
2 3/4	1.01	1.06	1.10	1.16	1.32	1.38
3	1.10	1.16	1.20	1.26	1.44	1.51
3 1/4	1.19	1.25	1.30	1.37	1.56	1.64
3 1/2	1.28	1.35	1.40	1.48	1.68	1.77
3 3/4	1.38	1.45	1.50	1.58	1.80	1.90
4	1.47	1.55	1.61	1.69	1.92	2.02
4 1/4	1.56	1.64	1.71	1.80	2.05	2.15
4 1/2	1.65	1.74	1.81	1.90	2.17	2.28
4 3/4			1.91	2.01	2.29	2.41
5			2.01	2.12	2.41	2.54
5 1/4			2.11	2.22	2.53	2.66
5 1/2			2.21	2.33	2.65	2.79
5 3/4			2.32	2.44	2.77	2.92
6			2.42	2.54	2.90	3.05
6 1/4					3.02	3.17
6 1/2					3.14	3.30
6 3/4					3.26	3.43
7					3.38	3.56

Variations from these weights must be expected in practice.

YELLOW BRASS AND COPPER TUBES

Pounds Per Linear Foot

Stubs' Gauges	18		17		16	
Inches	.049		.058		.065	
O. D. Inches	Brass	Copper	Brass	Copper	Brass	Copper
¼	.114	.120	.129	.136	.139	.146
9/32	.132	.139	.150	.158	.163	.171
5/16	.149	.157	.171	.180	.186	.196
3/8	.185	.195	.213	.224	.233	.245
7/16	.220	.232	.255	.268	.280	.295
½	.256	.269	.297	.312	.327	.344
9/16	.291	.306	.339	.356	.374	.394
5/8	.327	.344	.381	.400	.421	.443
¾	.398	.418	.465	.489	.515	.542
7/8	.468	.493	.548	.577	.609	.641
1	.539	.567	.632	.665	.703	.740
1¼	.681	.717	.800	.842	.891	.938
1½	.823	.866	.968	1.02	1.08	1.14
1¾	.965	1.01	1.14	1.19	1.27	1.33
2	1.11	1.16	1.30	1.37	1.46	1.53
2¼	1.25	1.31	1.47	1.55	1.64	1.73
2½	1.39	1.46	1.64	1.72	1.83	1.93
2¾	1.53	1.61	1.81	1.90	2.02	2.13
3	1.67	1.76	1.97	2.08	2.21	2.32
3¼	1.82	1.91	2.14	2.25	2.40	2.52
3½	1.96	2.06	2.31	2.43	2.58	2.72
3¾	2.10	2.21	2.48	2.61	2.77	2.92
4	2.24	2.36	2.65	2.78	2.96	3.11
4¼	2.38	2.51	2.81	2.96	3.15	3.31
4½	2.52	2.66	2.98	3.14	3.34	3.51
4¾	2.67	2.80	3.15	3.31	3.52	3.71
5	2.81	2.95	3.32	3.49	3.71	3.91
5¼	2.95	3.10	3.49	3.67	3.90	4.10
5½	3.09	3.25	3.65	3.84	4.09	4.30
5¾	3.23	3.40	3.82	4.02	4.28	4.50
6	3.37	3.55	3.99	4.20	4.46	4.70
6¼	3.52	3.70	4.16	4.37	4.65	4.90
6½	3.66	3.85	4.32	4.55	4.84	5.09
6¾	3.80	4.00	4.49	4.73	5.03	5.29
7	3.94	4.15	4.66	4.90	5.22	5.49
7¼			4.83	5.08	5.41	5.69
7½			5.00	5.26	5.59	5.88
7¾			5.16	5.43	5.78	6.08
8			5.33	5.61	5.97	6.28
8½					6.35	6.68
9					6.72	7.07
9½					7.10	7.47

Variations from these weights must be expected in practice.

YELLOW BRASS AND COPPER TUBES

Pounds Per Linear Foot

Stubs' Gauges	15		14		13	
Inches	.072		.083		.095	
O. D. Inches	Brass	Copper	Brass	Copper	Brass	Copper
7/16	.305	.320	.341	.358	.377	.396
1/2	.357	.375	.401	.421	.445	.469
9/16	.409	.430	.461	.485	.514	.541
5/8	.461	.485	.521	.548	.583	.613
3/4	.565	.594	.641	.674	.720	.758
7/8	.669	.704	.761	.800	.858	.902
1	.773	.814	.881	.927	.995	1.05
1 1/4	.982	1.03	1.12	1.18	1.27	1.34
1 1/2	1.19	1.25	1.36	1.43	1.54	1.63
1 3/4	1.40	1.47	1.60	1.68	1.82	1.91
2	1.61	1.69	1.84	1.94	2.09	2.20
2 1/4	1.81	1.91	2.08	2.19	2.37	2.49
2 1/2	2.02	2.13	2.32	2.44	2.64	2.78
2 3/4	2.23	2.35	2.56	2.70	2.92	3.07
3	2.44	2.57	2.80	2.95	3.19	3.36
3 1/4	2.65	2.79	3.04	3.20	3.47	3.65
3 1/2	2.86	3.01	3.28	3.45	3.74	3.94
3 3/4	3.06	3.22	3.52	3.71	4.02	4.23
4	3.27	3.44	3.76	3.96	4.29	4.52
4 1/4	3.48	3.66	4.00	4.21	4.57	4.81
4 1/2	3.69	3.88	4.24	4.46	4.84	5.10
4 3/4	3.90	4.10	4.48	4.72	5.12	5.38
5	4.11	4.32	4.72	4.97	5.39	5.67
5 1/4	4.31	4.54	4.96	5.22	5.67	5.96
5 1/2	4.52	4.76	5.20	5.47	5.94	6.25

Variations from these weights must be expected in practice.

BES

3
95

Copper
.396
.469
.541
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1.05
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5.38
5.67
5.96
6.25

ractice.

YELLOW BRASS AND COPPER TUBES

Pounds Per Linear Foot

Stubs' Gauges	15		14		13	
Inches	.072		.083		.095	
O. D. Inches	Brass	Copper	Brass	Copper	Brass	Copper
5¾	4.73	4.98	5.44	5.73	6.22	6.54
6	4.94	5.20	5.68	5.98	6.49	6.83
6¼	5.15	5.42	5.92	6.23	6.77	7.12
6½	5.36	5.64	6.16	6.49	7.04	7.41
6¾	5.56	5.85	6.40	6.74	7.32	7.70
7	5.77	6.07	6.64	6.99	7.59	7.99
7¼	5.98	6.29	6.88	7.24	7.87	8.28
7½	6.19	6.51	7.12	7.50	8.14	8.57
7¾	6.40	6.73	7.36	7.75	8.42	8.86
8	6.61	6.95	7.61	8.00	8.69	9.14
8½	7.02	7.39	8.09	8.51	9.24	9.72
9	7.44	7.83	8.57	9.01	9.79	10.30
9½	7.86	8.27	9.05	9.52	10.34	10.88
10			9.53	10.02	10.89	11.46
10½			10.01	10.53	11.44	12.04
11			10.49	11.03	11.99	12.61
11½			10.97	11.54	12.54	13.19
12			11.45	12.04	13.09	13.77
12½			11.93	12.55	13.64	14.35
13			12.41	13.05	14.19	14.93
13½			12.89	13.56	14.74	15.51
14			13.37	14.07	15.29	16.09
14½			13.85	14.57	15.84	16.66
15			14.33	15.08	16.39	17.24
16			15.29	16.09	17.49	18.40
17			16.25	17.10	18.59	19.56

Variations from these weights must be expected in practice.

DATA

YELLOW BRASS AND COPPER TUBES

Pounds Per Linear Foot

Stubs' Gauges	12		11		1/8"	
Inches	.109		.120		.125	
O. D. Inches	Brass	Copper	Brass	Copper	Brass	Copper
5/8	.651	.685	.701	.738	.723	.761
3/4	.809	.851	.875	.921	.904	.951
7/8	.966	1.02	1.05	1.10	1.09	1.14
1	1.12	1.18	1.22	1.29	1.27	1.33
1 1/4	1.44	1.51	1.57	1.65	1.63	1.71
1 1/2	1.75	1.85	1.92	2.02	1.99	2.09
1 3/4	2.07	2.18	2.26	2.38	2.35	2.47
2	2.39	2.51	2.61	2.75	2.71	2.85
2 1/4	2.70	2.84	2.96	3.11	3.07	3.23
2 1/2	3.02	3.17	3.31	3.48	3.44	3.61
2 3/4	3.33	3.51	3.65	3.84	3.80	4.00
3	3.65	3.84	4.00	4.21	4.16	4.38
3 1/4	3.96	4.17	4.35	4.57	4.52	4.76
3 1/2	4.28	4.50	4.69	4.94	4.88	5.14
3 3/4	4.59	4.83	5.04	5.30	5.24	5.52
4	4.91	5.16	5.39	5.67	5.61	5.90
4 1/4	5.22	5.50	5.74	6.03	5.97	6.28
4 1/2	5.54	5.83	6.08	6.40	6.33	6.66
4 3/4	5.85	6.16	6.43	6.77	6.69	7.04
5	6.17	6.49	6.78	7.13	7.05	7.42
5 1/4	6.49	6.82	7.12	7.50	7.41	7.80
5 1/2	6.80	7.16	7.47	7.86	7.78	8.18
5 3/4	7.12	7.49	7.82	8.23	8.14	8.56
6	7.43	7.82	8.17	8.59	8.50	8.94

Variations from these weights must be expected in practice.

YELLOW BRASS AND COPPER TUBES

Pounds Per Linear Foot

Stubs' Gauges	12		11		1/8"	
Inches	.109		.120		.125	
O. D. Inches	Brass	Copper	Brass	Copper	Brass	Copper
6 1/4	7.75	8.15	8.51	8.96	8.86	9.32
6 1/2	8.06	8.48	8.86	9.32	9.22	9.70
6 3/4	8.38	8.81	9.21	9.69	9.58	10.08
7	8.69	9.15	9.56	10.05	9.95	10.46
7 1/4	9.01	9.48	9.90	10.42	10.31	10.84
7 1/2	9.32	9.81	10.25	10.78	10.67	11.23
7 3/4	9.64	10.14	10.60	11.15	11.03	11.61
8	9.95	10.47	10.94	11.51	11.39	11.99
8 1/2	10.59	11.14	11.64	12.25	12.12	12.75
9	11.22	11.80	12.33	12.98	12.84	13.51
9 1/2	11.85	12.46	13.03	13.71	13.56	14.27
10	12.48	13.13	13.72	14.44	14.29	15.03
10 1/2	13.11	13.79	14.42	15.17	15.01	15.79
11	13.74	14.46	15.11	15.90	15.73	16.55
11 1/2	14.37	15.12	15.80	16.63	16.46	17.31
12	15.00	15.78	16.50	17.36	17.18	18.07
12 1/2	15.63	16.45	17.19	18.09	17.90	18.84
13	16.26	17.11	17.89	18.82	18.63	19.60
13 1/2	16.89	17.77	18.58	19.55	19.35	20.36
14	17.52	18.44	19.28	20.28	20.07	21.12
14 1/2	18.15	19.10	19.97	21.01	20.80	21.88
15	18.79	19.76	20.67	21.74	21.52	22.64
16	20.05	21.09	22.05	23.20	22.97	24.16
17	21.31	22.42	23.44	24.67	24.41	25.69

Variations from these weights must be expected in practice.

YELLOW BRASS AND COPPER TUBES

Pounds Per Linear Foot

Stubs' Gauges	10		9		.156	
Inches	.134		.148			
O. D. Inches	Brass	Copper	Brass	Copper	Brass	Copper
5/8	.761	.801	.817	.860	.847	.891
3/4	.955	1.01	1.03	1.08	1.07	1.13
7/8	1.15	1.21	1.25	1.31	1.30	1.37
1	1.34	1.41	1.46	1.54	1.52	1.60
1 1/4	1.73	1.82	1.89	1.99	1.98	2.08
1 1/2	2.12	2.23	2.32	2.44	2.43	2.55
1 3/4	2.51	2.64	2.74	2.89	2.88	3.03
2	2.89	3.04	3.17	3.34	3.33	3.50
2 1/4	3.28	3.45	3.60	3.79	3.78	3.98
2 1/2	3.67	3.86	4.03	4.24	4.23	4.45
2 3/4	4.06	4.27	4.46	4.69	4.68	4.93
3	4.44	4.68	4.89	5.14	5.13	5.40
3 1/4	4.83	5.08	5.31	5.59	5.59	5.88
3 1/2	5.22	5.49	5.74	6.04	6.04	6.35
3 3/4	5.61	5.90	6.17	6.49	6.49	6.83
4	6.00	6.31	6.60	6.94	6.94	7.30
4 1/4	6.38	6.72	7.03	7.39	7.39	7.78
4 1/2	6.77	7.12	7.45	7.84	7.84	8.25
4 3/4	7.16	7.53	7.88	8.29	8.29	8.73
5	7.55	7.94	8.31	8.74	8.75	9.20
5 1/4	7.93	8.35	8.74	9.19	9.20	9.68
5 1/2	8.32	8.76	9.17	9.65	9.65	10.15
5 3/4	8.71	9.16	9.60	10.10	10.10	10.63
6	9.10	9.57	10.02	10.55	10.55	11.10

Variations from these weights must be expected in practice.

YELLOW BRASS AND COPPER TUBES

Pounds Per Linear Foot

Stubs' Gauges	10		9		.156	
Inches	.134		.148			
O. D. Inches	Brass	Copper	Brass	Copper	Brass	Copper
6¼	9.49	9.98	10.45	11.00	11.00	11.58
6½	9.87	10.39	10.88	11.45	11.45	12.05
6¾	10.26	10.80	11.31	11.90	11.91	12.53
7	10.65	11.20	11.74	12.35	12.36	13.00
7¼	11.04	11.61	12.16	12.80	12.81	13.48
7½	11.42	12.02	12.59	13.25	13.26	13.95
7¾	11.81	12.43	13.02	13.70	13.71	14.43
8	12.20	12.83	13.45	14.15	14.16	14.90
8½	12.97	13.65	14.31	15.05	15.06	15.85
9	13.75	14.47	15.16	15.95	15.97	16.80
9½	14.53	15.28	16.02	16.85	16.87	17.75
10	15.30	16.10	16.88	17.75	17.77	18.70
10½	16.08	16.91	17.73	18.66	18.68	19.65
11	16.85	17.73	18.59	19.56	19.58	20.60
11½	17.63	18.55	19.44	20.46	20.48	21.55
12	18.40	19.36	20.30	21.36	21.38	22.50
12½	19.18	20.18	21.16	22.26	22.29	23.45
13	19.95	20.99	22.01	23.16	23.19	24.40
13½	20.73	21.81	22.87	24.06	24.09	25.35
14	21.50	22.63	23.73	24.96	25.00	26.30
14½	22.28	23.44	24.58	25.86	25.90	27.25
15	23.06	24.26	25.44	26.77	26.80	28.20
16	24.61	25.89	27.15	28.57	28.61	30.10
17	26.16	27.52	28.87	30.37	30.41	32.00

Variations from these weights must be expected in practice.

YELLOW BRASS AND COPPER TUBES

Pounds Per Linear Foot

Stubs' Gauges	8		7		6	
Inches	.165		.180		.203	
O. D. Inches	Brass	Copper	Brass	Copper	Brass	Copper
⅝	.878	.924				
¾	1.12	1.18				
⅞	1.36	1.43				
1	1.59	1.68				
1¼	2.07	2.18				
1½	2.55	2.68				
1¾	3.03	3.18	3.27	3.44	3.63	3.82
2	3.50	3.69	3.79	3.99	4.22	4.44
2¼	3.98	4.19	4.31	4.54	4.81	5.06
2½	4.46	4.69	4.83	5.09	5.40	5.68
2¾	4.94	5.19	5.35	5.63	5.98	6.30
3	5.41	5.70	5.87	6.18	6.57	6.91
3¼	5.89	6.20	6.40	6.73	7.16	7.53
3½	6.37	6.70	6.92	7.28	7.75	8.15
3¾	6.85	7.20	7.44	7.82	8.33	8.77
4	7.32	7.71	7.96	8.37	8.92	9.39
4¼	7.80	8.21	8.48	8.92	9.51	10.00
4½	8.28	8.71	9.00	9.47	10.10	10.62
4¾	8.76	9.21	9.52	10.02	10.68	11.24
5	9.23	9.71	10.04	10.56	11.27	11.86
5¼	9.71	10.22	10.56	11.11	11.86	12.48
5½	10.19	10.72	11.08	11.66	12.44	13.09
5¾	10.67	11.22	11.60	12.21	13.03	13.71
6	11.14	11.72	12.12	12.76	13.62	14.33

Variations from these weights must be expected in practice.

YELLOW BRASS AND COPPER TUBES

Pounds Per Linear Foot

Stubs' Gauges	8		7		6	
Inches	.165		.180		.203	
O. D. Inches	Brass	Copper	Brass	Copper	Brass	Copper
6¼	11.62	12.23	12.65	13.30	14.21	14.95
6½	12.10	12.73	13.17	13.85	14.79	15.57
6¾	12.57	13.23	13.69	14.40	15.38	16.18
7	13.05	13.73	14.21	14.95	15.97	16.80
7¼	13.53	14.23	14.73	15.50	16.56	17.42
7½	14.01	14.74	15.25	16.04	17.14	18.04
7¾	14.48	15.24	15.77	16.59	17.73	18.66
8	14.96	15.74	16.29	17.14	18.32	19.27
8½	15.92	16.75	17.33	18.24	19.49	20.51
9	16.87	17.75	18.37	19.33	20.67	21.75
9½	17.83	18.76	19.42	20.43	21.84	22.98
10	18.78	19.76	20.46	21.52	23.02	24.22
10½	19.74	20.76	21.50	22.62	24.19	25.45
11	20.69	21.77	22.54	23.72	25.37	26.69
11½	21.65	22.77	23.58	24.81	26.54	27.92
12	22.60	23.78	24.62	25.91	27.72	29.16
12½	23.56	24.78	25.67	27.00	28.89	30.40
13	24.51	25.79	26.71	28.10	30.07	31.63
13½	25.47	26.79	27.75	29.20	31.24	32.87
14	26.42	27.80	28.79	30.29	32.42	34.10
14½	27.37	28.80	29.83	31.39	33.59	35.34
15	28.33	29.81	30.87	32.48	34.76	36.58
16	30.24	31.82	32.96	34.67	37.11	39.05
17	32.15	33.82	35.04	36.87	39.46	41.52

Variations from these weights must be expected in practice.

YELLOW BRASS AND COPPER TUBES

Pounds Per Linear Foot

Stubs' Gauges	5		4		3	
Inches	.220		.238		.259	
O. D. Inches	Brass	Copper	Brass	Copper	Brass	Copper
1¾	3.90	4.10	4.16	4.38	4.47	4.70
2	4.53	4.77	4.85	5.11	5.22	5.49
2¼	5.17	5.44	5.54	5.83	5.97	6.28
2½	5.81	6.11	6.23	6.56	6.72	7.07
2¾	6.44	6.78	6.92	7.28	7.47	7.86
3	7.08	7.45	7.61	8.00	8.22	8.64
3¼	7.71	8.12	8.30	8.73	8.97	9.43
3½	8.35	8.79	8.99	9.45	9.72	10.22
3¾	8.99	9.46	9.67	10.18	10.46	11.01
4	9.62	10.13	10.36	10.90	11.21	11.80
4¼	10.26	10.80	11.05	11.63	11.96	12.59
4½	10.90	11.47	11.74	12.35	12.71	13.38
4¾	11.53	12.14	12.43	13.08	13.46	14.16
5	12.17	12.81	13.12	13.80	14.21	14.95
5¼	12.81	13.47	13.81	14.53	14.96	15.74
5½	13.44	14.14	14.49	15.25	15.71	16.53
5¾	14.08	14.81	15.18	15.97	16.46	17.32
6	14.72	15.48	15.87	16.70	17.21	18.11
6¼	15.35	16.15	16.56	17.42	17.96	18.89
6½	15.99	16.82	17.25	18.15	18.71	19.68
6¾	16.63	17.49	17.94	18.87	19.46	20.47
7	17.26	18.16	18.63	19.60	20.21	21.26
7¼	17.90	18.83	19.31	20.32	20.96	22.05
7½	18.54	19.50	20.00	21.05	21.71	22.84
7¾	19.17	20.17	20.69	21.77	22.45	23.63
8	19.81	20.84	21.38	22.49	23.20	24.41
8½	21.08	22.18	22.76	23.94	24.70	25.99
9	22.36	23.52	24.14	25.39	26.20	27.57
9½	23.63	24.86	25.51	26.84	27.70	29.14
10	24.90	26.20	26.89	28.29	29.20	30.72
10½	26.17	27.54	28.27	29.74	30.70	32.30
11	27.45	28.88	29.64	31.19	32.20	33.87
11½	28.72	30.22	31.02	32.64	33.70	35.45
12	29.99	31.56	32.40	34.09	35.19	37.03
12½	31.27	32.90	33.78	35.54	36.69	38.61
13	32.54	34.24	35.15	36.99	38.19	40.18
13½	33.81	35.58	36.53	38.43	39.69	41.76
14	35.09	36.92	37.91	39.88	41.19	43.34
14½	36.36	38.25	39.28	41.33	42.69	44.91
15	37.63	39.59	40.66	42.78	44.19	46.49
16	40.18	42.27	43.42	45.68	47.18	49.64
17	42.73	44.95	46.17	48.58	50.18	52.80

Variations from these weights must be expected in practice.

YELLOW BRASS AND COPPER TUBES

Pounds Per Linear Foot

Stubs' Gauges	2		1		3/8"	
Inches	.284		.300		.375	
O. D. Inches	Brass	Copper	Brass	Copper	Brass	Copper
6	18.79	19.77	19.79	20.82	24.41	25.69
6¼	19.61	20.63	20.66	21.74	25.50	26.83
6½	20.43	21.50	21.53	22.65	26.58	27.97
6¾	21.25	22.36	22.39	23.56	27.67	29.11
7	22.07	23.23	23.26	24.48	28.75	30.25
7¼	22.90	24.09	24.13	25.39	29.84	31.39
7½	23.72	24.95	25.00	26.30	30.92	32.53
7¾	24.54	25.82	25.87	27.22	32.01	33.68
8	25.36	26.68	26.74	28.13	33.09	34.82
8½	27.01	28.41	28.47	29.95	35.26	37.10
9	28.65	30.14	30.21	31.78	37.43	39.38
9½	30.29	31.87	31.94	33.61	39.60	41.67
10	31.94	33.60	33.68	35.43	41.77	43.95
10½	33.58	35.33	35.42	37.26	43.94	46.23
11	35.22	37.06	37.15	39.09	46.11	48.52
11½	36.87	38.79	38.89	40.91	48.28	50.80
12	38.51	40.52	40.62	42.74	50.45	53.08
12½	40.15	42.25	42.36	44.57	52.62	55.37
13	41.80	43.97	44.10	46.39	54.79	57.65
13½	43.44	45.70	45.83	48.22	56.96	59.93
14	45.08	47.43	47.57	50.05	59.13	62.22
14½	46.73	49.16	49.30	51.87	61.30	64.50
15	48.37	50.89	51.04	53.70	63.47	66.78
16	51.66	54.35	54.51	57.35	67.81	71.35
17	54.94	57.81	57.98	61.01	72.15	75.91

Variations from these weights must be expected in practice.

General Formulas

To determine the weight in pounds per linear foot of a Seamless Tube size not shown in the foregoing tables:

1. When O.D. is given:
   Subtract gauge from O.D.
   Multiply by gauge
   Multiply by—
   11.5736 for Brass
   12.1768 for Copper

2. When I.D. is given:
   Add gauge to I.D.
   Multiply by gauge
   Multiply by—
   11.5736 for Brass
   12.1768 for Copper

The above factors are arrived at by using a density of .307 pounds per cubic inch for Yellow Brass and .323 pounds per cubic inch for Deoxidized Copper.

COPPER WATER TUBES

Pounds Per Linear Foot

TYPE K

Nominal Size Inches	O. D. Inches	I. D. Inches	Wall Inches	Weights
1/8	.250	.186	.032	.085
1/4	.375	.311	.032	.134
3/8	.500	.402	.049	.269
1/2	.625	.527	.049	.344
5/8	.750	.652	.049	.418
3/4	.875	.745	.065	.641
1	1.125	.995	.065	.839
1 1/4	1.375	1.245	.065	1.04
1 1/2	1.625	1.481	.072	1.36
2	2.125	1.959	.083	2.06
2 1/2	2.625	2.435	.095	2.92
3	3.125	2.907	.109	4.00
3 1/2	3.625	3.385	.120	5.12
4	4.125	3.857	.134	6.51
5	5.125	4.805	.160	9.67
6	6.125	5.741	.192	13.87
8	8.125	7.583	.271	25.90

TYPE L

1/8	.250	.200	.025	.068
1/4	.375	.315	.030	.126
3/8	.500	.430	.035	.198
1/2	.625	.545	.040	.284
5/8	.750	.666	.042	.362
3/4	.875	.785	.045	.454
1	1.125	1.025	.050	.653
1 1/4	1.375	1.265	.055	.882
1 1/2	1.625	1.505	.060	1.14
2	2.125	1.985	.070	1.75
2 1/2	2.625	2.465	.080	2.48
3	3.125	2.945	.090	3.33
3 1/2	3.625	3.425	.100	4.29
4	4.125	3.905	.110	5.38
5	5.125	4.875	.125	7.61
6	6.125	5.845	.140	10.20
8	8.125	7.725	.200	19.29

Variations from these weights must be expected in practice.

ANACONDA PIPE

Standard Pipe Sizes

Pounds Per Linear Foot

REGULAR

Nominal Size Inches	O. D. Inches	Wall Inches	67 Brass Admiralty	85 Red Brass	Copper	Everdur 1010
⅛	.405	.0620	.246	.253	.259	.247
¼	.540	.0825	.437	.450	.460	.438
⅜	.675	.0905	.612	.630	.643	.614
½	.840	.1075	.911	.938	.957	.914
¾	1.050	.1140	1.24	1.27	1.30	1.24
1	1.315	.1265	1.74	1.79	1.83	1.75
1¼	1.660	.1460	2.56	2.63	2.69	2.57
1½	1.900	.1500	3.04	3.13	3.20	3.05
2	2.375	.1565	4.02	4.14	4.23	4.03
2½	2.875	.1875	5.83	6.00	6.14	5.85
3	3.500	.2190	8.31	8.56	8.75	8.34
3½	4.000	.2500	10.85	11.17	11.41	10.89
4	4.500	.2500	12.29	12.66	12.94	12.34
4½	5.000	.2500	13.74	14.15	14.46	13.79
5	5.563	.2500	15.40	15.85	16.21	15.45
6	6.625	.2500	18.44	18.99	19.41	18.51
7	7.625	.2815	23.92	24.63	25.17	24.00
8	8.625	.3125	30.05	30.95	31.63	30.16
9	9.625	.3440	36.94	38.03	38.83	37.07
10	10.750	.3655	43.91	45.20	46.22	44.07
11	11.750	.3750	49.37	50.81	51.94	49.53
12	12.750	.3750	53.71	55.29	56.51	53.88

Weights for Everdur-1015 are the same as for 85 Red Brass.

Variations from these weights must be expected in practice.

ANACONDA PIPE

Standard Pipe Sizes

Pounds Per Linear Foot

EXTRA STRONG

Nominal Size Inches	O. D. Inches	Wall Inches	67 Brass Admiralty	85 Red Brass	Copper	Everdur 1010
⅛	.405	.100	.353	.363	.371	.354
¼	.540	.123	.593	.611	.624	.596
⅜	.675	.127	.805	.829	.847	.808
½	.840	.149	1.19	1.23	1.25	1.20
¾	1.050	.157	1.62	1.67	1.71	1.63
1	1.315	.182	2.39	2.46	2.51	2.39
1¼	1.660	.194	3.30	3.39	3.46	3.30
1½	1.900	.203	3.99	4.10	4.19	4.00
2	2.375	.221	5.51	5.67	5.79	5.53
2½	2.875	.280	8.41	8.66	8.84	8.44
3	3.500	.304	11.24	11.57	11.82	11.28
3½	4.000	.321	13.67	14.07	14.37	13.71
4	4.500	.341	16.41	16.89	17.25	16.47
4½	5.000	.375	20.07	20.66	21.10	20.14
5	5.563	.375	22.52	23.18	23.67	22.59
6	6.625	.437	31.32	32.21	32.93	31.40
7	7.625	.500	41.23	42.43	43.34	41.37
8	8.625	.500	47.02	48.39	49.42	47.17
9	9.625	.500	52.81	54.34	55.56	52.98
10	10.750	.500	59.32	61.05	62.40	59.51

Variations from these weights must be expected in practice.

ANACONDA PIPE

Standard Pipe Sizes

Pounds Per Linear Foot

DOUBLE EXTRA STRONG

Nominal Size Inches	O. D. Inches	Wall Inches	67 Brass Admiralty	85 Red Brass	Copper
½	.840	.294	1.86	1.91	1.95
¾	1.050	.308	2.64	2.72	2.78
1	1.315	.358	3.97	4.08	4.17
1¼	1.660	.382	5.65	5.82	5.94
1½	1.900	.400	6.94	7.15	7.31
2	2.375	.436	9.78	10.07	10.29
2½	2.875	.552	14.84	15.28	15.61
3	3.500	.600	20.14	20.73	21.19
3½	4.000	.636	24.76	25.49	26.05
4	4.500	.674	29.85	30.72	31.40
4½	5.000	.710	35.25	36.29	37.09
5	5.563	..750	41.78	43.00	43.96
6	6.625	.864	57.61	59.30	60.61
7	7.625	.875	68.36	70.36	71.92
8	8.625	.875	78.48	80.78	82.57

Variations from these weights must be expected in practice.

ANACONDA ELECTRICAL CONDUIT

Pounds Per Linear Foot

EVERDUR EMT CONDUIT

Nominal Size Inches	O. D. Inches	I. D. Inches	Wall Inches	Weights
⅜	.577	.493	.042	.268
½	.706	.622	.042	.332
¾	.922	.824	.049	.510
1	1.165	1.049	.058	.765
1¼	1.51	1.38	.065	1.12
1½	1.74	1.61	.065	1.30
2	2.19	2.06	.065	1.65

EVERDUR RIGID CONDUIT

Nominal Size Inches	O. D. Inches	I. D. Inches	Wall Inches	Weights
¼	.540	.382	.079	.434
⅜	.675	.503	.086	.603
½	.840	.636	.102	.897
¾	1.050	.834	.108	1.21
1	1.315	1.075	.120	1.71
1¼	1.660	1.382	.139	2.52
1½	1.900	1.614	.143	2.99
2	2.375	2.077	.149	3.95
2½	2.875	2.519	.178	5.72
3	3.500	3.084	.208	8.16
3½	4.000	3.524	.238	10.67
4	4.500	4.024	.238	12.08

Variations from these weights must be expected in practice.

ANACONDA CONDENSER TUBES

HEAT EXCHANGER TUBES

Surface and Cross Sectional Areas

Stubs' Gauge

Outside Diameter Inches	Thickness		O.D. Surface Area Square Feet per Linear Foot	Cross Sectional Area of Bore Square Feet
	Gauges	Inches		
5/8	14	.083	.164	.00115
	15	.072		.00126
	16	.065		.00134
	17	.058		.00141
	18	.049		.00151
3/4	14	.083	.196	.00186
	15	.072		.00200
	16	.065		.00210
	17	.058		.00219
	18	.049		.00232
7/8	14	.083	.229	.00274
	15	.072		.00291
	16	.065		.00303
	17	.058		.00314
	18	.049		.00329
1	14	.083	.262	.00379
	15	.072		.00400
	16	.065		.00413
	17	.058		.00426
	18	.049		.00444
1 1/4	14	.083	.327	.00641
	15	.072		.00667
	16	.065		.00684
	17	.058		.00701
	18	.049		.00724

ANACONDA CONDENSER TUBES
HEAT EXCHANGER TUBES
Pounds Per Linear Foot

Stubs' Gauge

Outside Diameter Inches	Thickness		Super-Nickel	Ambrac 850	Ambraloy 927
	Gauges	Inches			
5/8	14	.083	.548	.543	.510
	15	.072	.485	.480	.452
	16	.065	.443	.439	.413
	17	.058	.400	.397	.373
	18	.049	.344	.340	.320
3/4	14	.083	.674	.668	.628
	15	.072	.594	.589	.554
	16	.065	.542	.537	.505
	17	.058	.489	.484	.455
	18	.049	.418	.414	.390
7/8	14	.083	.800	.793	.746
	15	.072	.704	.697	.656
	16	.065	.641	.635	.597
	17	.058	.577	.572	.538
	18	.049	.493	.488	.459
1	14	.083	.927	.918	.864
	15	.072	.814	.806	.758
	16	.065	.740	.733	.690
	17	.058	.665	.659	.620
	18	.049	.567	.562	.529
1 1/4	14	.083	1.179	1.169	1.099
	15	.072	1.033	1.023	.962
	16	.065	.938	.929	.874
	17	.058	.842	.834	.785
	18	.049	.717	.710	.668

Anaconda Condenser Tubes and Heat Exchanger Tubes manufactured in outside diameters 5/8 in. to and including 2 in.; Stubs' Gauges 8 to and including 19.

ANACONDA CONDENSER TUBES
HEAT EXCHANGER TUBES
Pounds Per Linear Foot

Stubs' Gauge

Outside Diameter Inches	Thickness		Admiralty also "70 & 30" Brass	Muntz Metal	Copper (Deoxidized or Arsenical)
	Gauges	Inches			
5/8	14	.083	.522	.519	.548
	15	.072	.462	.459	.485
	16	.065	.423	.420	.443
	17	.058	.382	.379	.400
	18	.049	.328	.326	.344
3/4	14	.083	.643	.639	.674
	15	.072	.567	.563	.594
	16	.065	.517	.514	.542
	17	.058	.466	.463	.489
	18	.049	.399	.396	.418
7/8	14	.083	.763	.758	.800
	15	.072	.671	.667	.704
	16	.065	.611	.607	.641
	17	.058	.550	.547	.577
	18	.049	.470	.467	.493
1	14	.083	.884	.878	.927
	15	.072	.776	.771	.814
	16	.065	.706	.701	.740
	17	.058	.634	.630	.665
	18	.049	.541	.538	.567
1 1/4	14	.083	1.125	1.117	1.179
	15	.072	.985	.978	1.033
	16	.065	.894	.889	.938
	17	.058	.803	.798	.842
	18	.049	.683	.679	.717

Anaconda Condenser Tubes and Heat Exchanger Tubes manufactured in outside diameters 5/8 in. to and including 2 in.; Stubs' Gauges 8 to and including 19.

SHEETS

WIRE

RODS

TUBES

MEMORANDA

DATA

See Reverse Side

SHEETS

WIRE

RODS

TUBES

DATA

ANACONDA ALLOYS

CHEMICAL AND PHYSICAL PROPERTIES

Approximate Alloy Composition

Tensile Strength

Elongation

Yield Point

Young's Modulus of Elasticity

Rockwell Hardness

Melting Point

Density

Coefficient of Expansion

Electrical Conductivity

Thermal Conductivity

MEMORANDA

MELTING POINTS

Elements	Symbols	Degrees Centigrade	Degrees Fahrenheit
Aluminum	Al	660.16	1220.29
Antimony	Sb	630.5	1166.9
Arsenic	As	814*	1497*
Barium	Ba	850	1562
Beryllium	Be	1350	2462
Bismuth	Bi	271.3	520.3
Cadmium	Cd	320.9	609.6
Calcium	Ca	810	1490
Carbon	C	3500	6332
Chromium	Cr	1765	3209
Cobalt	Co	1480	2696
Copper	Cu	1083.0	1981.4
Gold	Au	1063.0	1945.4
Iron	Fe	1535	2795
Lead	Pb	327.4	621.3
Lithium	Li	186	367
Magnesium	Mg	651	1204
Manganese	Mn	1260	2300
Mercury	Hg	–38.87	–37.97
Molybdenum	Mo	2620	4748
Nickel	Ni	1455	2651
Phosphorus (yellow)	P	44.1	111.4
Platinum	Pt	1773	3223
Silicon	Si	1420	2588
Silver	Ag	960.5	1760.9
Tin	Sn	231.9	449.4
Tungsten	W	3400	6152
Vanadium	V	1710	3110
Zinc	Zn	419.5	787.1

* At 36 atmospheres.

Note: The melting points of Brass and Copper Alloys may be found on pages 159—162.

Variations from these values must be expected in practice.

EXPANSION OF METALS BY HEAT

The coefficient of linear expansion of a body is the rate at which the unit of length changes, under constant pressure, with an increase of unit or one degree of temperature; the coefficient of expansion for areas is, approximately, two times, and the coefficient of cubical expansion three times the coefficient of linear expansion. A bar, if not fixed, undergoes a change in length $= ltn$, where l is the length of the bar, t the number of degrees, n the corresponding linear coefficient.

To find the increase of a bar due to an increase in temperature, multiply the length of the bar by the increase in degrees and by the coefficient from the table.

COEFFICIENTS OF LINEAR EXPANSION BETWEEN ROOM TEMPERATURE AND 100°C (212°F)

Metal	per °C	per °F
Aluminum	0.0000238	0.0000132
Brass (85% Cu)—Cold Drawn	.0000177	.0000098
Brass (75% Cu)—Cold Drawn	.0000184	.0000102
Brass (65% Cu)—Cold Drawn	.0000190	.0000105
Bronze (4.2% Sn)—Cold Drawn	.0000173	.0000096
Copper	.0000168	.0000094
Everdur-1010	.0000170	.0000094
Gold	.0000143	.0000079
Iron, cast gray (3.1%C, 1.7%Si)	.0000084	.0000047
Iron, electrolytic	.0000120	.0000067
Lead	.0000291	.0000162
Magnesium	.0000260	.0000144
Nickel	.0000133	.0000074
Platinum	.0000090	.0000050
Silver	.0000191	.0000106
Steels	.0000111 to .0000124	.0000062 to .0000069
Tin[1]	.0000270	.0000150
Zinc[1], cast	.0000395	.0000219

[1] Anisotropic; coefficient of expansion varies with different samples.

Variations from these values must be expected in practice.

HEAT CONDUCTIVITY OF METALS AND ALLOYS AT 18°C

The heat conductivity k of a material is the quantity of heat in small calories which is transmitted per second through a plate one centimeter thick per square centimeter of its surface when the difference of temperature between the two faces of the plate is one degree Centigrade. The column k_{18} in the table below gives the conductivity at 18° C. and the units are calories per square centimeter per centimeter per second per degree Centigrade. The value of k is found to vary with the temperature of the plate and the column a is the temperature coefficient of thermal conductivity per degree Centigrade at 18° C. The temperature coefficient a is fairly accurate for the approximate range from −50° C. to 200° C. and the conductivity at any temperature t in this range is given by the equation:

$$k_t = k_{18}\,[1 + a(t - 18)]$$

The values for conductivity can be converted to the ordinary engineering units by the following factors:

Units	Factors by which Cal./sq.Cm./Cm./Sec./°C. Should be Multiplied to Convert to the Desired Units
Watts/sq. cm./cm./°C.	4.186
BTU/sq. ft./in./sec./°F.	0.8064
BTU/sq. ft./in./hour/°F.	2903.
BTU/sq. ft./ft./hour/°F.	241.9

Metal	k_{18}	a
Aluminum	0.514	+0.0002
Brass, Yellow	0.285	+0.0010
Red Brass—85%	0.380	+0.0013
Copper	0.923	−0.000041
Iron (Pure)	0.170	−0.0008
Lead	0.083	−0.00057
Nickel (Pure)	0.217	−0.0010
Nickel (Commercial Malleable)	0.167	−0.0007
Tin	0.154	−0.00069
Zinc	0.275	−0.0003

Variations from these values must be expected in practice.

RESISTIVITY OF METALS AND ALLOYS AT 20° C

The resistivities are the values of p in the equation $R = pl/s$, where R is the resistance in microhms of a length l $cm.$ of uniform cross section s cm^2. The temperature coefficient is a_{20} in the formula $R_t = R_{20}\,[1 + a_{20}(t - 20)]$.

Metal	Resistivity in Microhm Centimeters	Temperature Coefficient at 20°C.	Electrical Conductivity Compared with Annealed Copper as 100.0
Aluminum	2.828	.0039	61.0
Beryllium Copper Soft or Hard Drawn	10.0 ±	. . . . .	17 ±
Beryllium Copper Heat treated	6.8-9.8	. . . . .	18-25
Brass (65% Cu)	6.4	. . . . .	26.8
Copper (Annealed) . . .	1.7241	.00393	100.0
Copper (Hard Drawn)	1.77	.00382	97.4
Everdur-1010	25.8	.00034	6.7
Iron (99.98%)	9.78	. . . . .	17.6
Lead	20.8	.0039	8.3
Nickel	7.3	.006	23.6
Nickel Silver (18%Ni)	31.4	.00033	5.5
Tin	11.5	.0042	15.0
Zinc	5.9	.0037	29.2

Variations from these values must be expected in practice.

RULES RELATIVE TO THE CIRCLE

Hexagon and Octagon

To Find the Radius:

Multiply the diameter by		.50000	Log.	$= \bar{1}.69897$
Or " " circumference by		.15915	"	$= \bar{1}.20182$
" " " sq. root of the area by		.56419	"	$= \bar{1}.75143$

To Find the Diameter:

Multiply the radius by		2.00000	Log.	$= 0.30103$
Or " " circumference by		0.31831	"	$= \bar{1}.50285$
" " " sq. root of the area by		1.1284	"	$= 0.05246$

To Find the Circumference:

Multiply the radius by		6.2832	Log.	$= 0.79818$
Or " " diameter by		3.1416	"	$= 0.49715$
" " " sq. root of the area by		3.5449	"	$= 0.54960$

To Find the Area:

Multiply the sq. of the radius by		3.1416	Log.	$= 0.49715$
Or " " " " " diameter by		0.78540	"	$= \bar{1}.89509$
" " " " " "circumference by		0.079577	"	$= \bar{2}.90079$

To Find the Area of a Hexagon:

Multiply the sq. of the distance between flats by	0.86603	Log.	$= \bar{1}.93753$
Or multiply the area of the inscribed circle by	1.1027	"	$= 0.04244$

To Find the Area of an Octagon:

Multiply the sq. of the distance between flats by	0.82843	Log.	$= \bar{1}.91825$
Or multiply the area of the inscribed circle by	1.0548	"	$= 0.02316$

CIRCLES AND SQUARES

Circumferences and Areas

Size Inches	Circumference of ○ in Inches	Area of ○ in Square Inches	Area of □ in Square Inches	Size Inches	Circumference of ○ in Inches	Area of ○ in Square Inches	Area of □ in Square Inches
				2	6.283	3.142	4.000
1/16	.1963	.0031	.0039	2 1/16	6.480	3.341	4.254
1/8	.3927	.0123	.0156	2 1/8	6.676	3.547	4.516
3/16	.5890	.0276	.0352	2 3/16	6.872	3.758	4.785
1/4	.7854	.0491	.0625	2 1/4	7.069	3.976	5.063
5/16	.9817	.0767	.0977	2 5/16	7.265	4.200	5.348
3/8	1.178	.1104	.1406	2 3/8	7.461	4.430	5.641
7/16	1.374	.1503	.1914	2 7/16	7.658	4.666	5.941
1/2	1.571	.1963	.2500	2 1/2	7.854	4.909	6.250
9/16	1.767	.2485	.3164	2 9/16	8.050	5.157	6.566
5/8	1.963	.3068	.3906	2 5/8	8.247	5.412	6.891
11/16	2.160	.3712	.4727	2 11/16	8.443	5.673	7.223
3/4	2.356	.4418	.5625	2 3/4	8.639	5.940	7.563
13/16	2.553	.5185	.6602	2 13/16	8.836	6.213	7.910
7/8	2.749	.6013	.7656	2 7/8	9.032	6.492	8.266
15/16	2.945	.6903	.8789	2 15/16	9.228	6.777	8.629
1	3.142	.7854	1.000	3	9.425	7.069	9.000
1 1/16	3.338	.8866	1.129	3 1/16	9.621	7.366	9.379
1 1/8	3.534	.9940	1.266	3 1/8	9.817	7.670	9.766
1 3/16	3.731	1.108	1.410	3 3/16	10.01	7.980	10.16
1 1/4	3.927	1.227	1.563	3 1/4	10.21	8.296	10.56
1 5/16	4.123	1.353	1.723	3 5/16	10.41	8.618	10.97
1 3/8	4.320	1.485	1.891	3 3/8	10.60	8.946	11.39
1 7/16	4.516	1.623	2.066	3 7/16	10.80	9.281	11.82
1 1/2	4.712	1.767	2.250	3 1/2	11.00	9.621	12.25
1 9/16	4.909	1.917	2.441	3 9/16	11.19	9.968	12.69
1 5/8	5.105	2.074	2.641	3 5/8	11.39	10.32	13.14
1 11/16	5.301	2.237	2.848	3 11/16	11.58	10.68	13.60
1 3/4	5.498	2.405	3.063	3 3/4	11.78	11.04	14.06
1 13/16	5.694	2.580	3.285	3 13/16	11.98	11.42	14.54
1 7/8	5.890	2.761	3.516	3 7/8	12.17	11.79	15.02
1 15/16	6.087	2.948	3.754	3 15/16	12.37	12.18	15.50

Note: Weights of Circles may be found on page 55.

CIRCLES AND SQUARES

Circumferences and Areas

Size Inches	Circumference of ○ in Inches	Area of ○ in Square Inches	Area of □ in Square Inches	Size Inches	Circumference of ○ in Inches	Area of ○ in Square Inches	Area of □ in Square Inches
4	12.57	12.57	16.00	6	18.85	28.27	36.00
4 1/16	12.76	12.96	16.50	6 1/16	19.05	28.87	36.75
4 1/8	12.96	13.36	17.02	6 1/8	19.24	29.46	37.52
4 3/16	13.16	13.77	17.54	6 3/16	19.44	30.07	38.29
4 1/4	13.35	14.19	18.06	6 1/4	19.63	30.68	39.06
4 5/16	13.55	14.61	18.60	6 5/16	19.83	31.30	39.85
4 3/8	13.74	15.03	19.14	6 3/8	20.03	31.92	40.64
4 7/16	13.94	15.47	19.69	6 7/16	20.22	32.55	41.44
4 1/2	14.14	15.90	20.25	6 1/2	20.42	33.18	42.25
4 9/16	14.33	16.35	20.82	6 9/16	20.62	33.82	43.07
4 5/8	14.53	16.80	21.39	6 5/8	20.81	34.47	43.89
4 11/16	14.73	17.26	21.97	6 11/16	21.01	35.13	44.72
4 3/4	14.92	17.72	22.56	6 3/4	21.21	35.78	45.56
4 13/16	15.12	18.19	23.16	6 13/16	21.40	36.45	46.41
4 7/8	15.32	18.67	23.77	6 7/8	21.60	37.12	47.27
4 15/16	15.51	19.15	24.38	6 15/16	21.79	37.80	48.13
5	15.71	19.63	25.00	7	21.99	38.48	49.00
5 1/16	15.90	20.13	25.63	7 1/16	22.19	39.17	49.88
5 1/8	16.10	20.63	26.27	7 1/8	22.38	39.87	50.77
5 3/16	16.30	21.14	26.91	7 3/16	22.58	40.57	51.66
5 1/4	16.49	21.65	27.56	7 1/4	22.78	41.28	52.56
5 5/16	16.69	22.17	28.22	7 5/16	22.97	42.00	53.47
5 3/8	16.89	22.69	28.89	7 3/8	23.17	42.72	54.39
5 7/16	17.08	23.22	29.57	7 7/16	23.37	43.45	55.32
5 1/2	17.28	23.76	30.25	7 1/2	23.56	44.18	56.25
5 9/16	17.48	24.30	30.94	7 9/16	23.76	44.92	57.19
5 5/8	17.67	24.85	31.64	7 5/8	23.95	45.66	58.14
5 11/16	17.87	25.41	32.35	7 11/16	24.15	46.42	59.10
5 3/4	18.06	25.97	33.06	7 3/4	24.35	47.17	60.06
5 13/16	18.26	26.53	33.79	7 13/16	24.54	47.94	61.04
5 7/8	18.46	27.11	34.52	7 7/8	24.74	48.71	62.02
5 15/16	18.65	27.69	35.25	7 15/16	24.94	49.48	63.00

CIRCLES AND SQUARES

Circumferences and Areas

Size Inches	Circumference of ○ in Inches	Area of ○ in Square Inches	Area of □ in Square Inches	Size Inches	Circumference of ○ in Inches	Area of ○ in Square Inches	Area of □ in Square Inches
8	25.13	50.27	64.00	10	31.42	78.54	100.0
8 1/16	25.33	51.05	65.00	10 1/16	31.61	79.52	101.3
8 1/8	25.53	51.85	66.02	10 1/8	31.81	80.52	102.5
8 3/16	25.72	52.65	67.04	10 3/16	32.00	81.51	103.8
8 1/4	25.92	53.46	68.06	10 1/4	32.20	82.52	105.1
8 5/16	26.11	54.27	69.10	10 5/16	32.40	83.52	106.3
8 3/8	26.31	55.09	70.14	10 3/8	32.59	84.54	107.6
8 7/16	26.51	55.91	71.19	10 7/16	32.79	85.56	108.9
8 1/2	26.70	56.75	72.25	10 1/2	32.99	86.59	110.3
8 9/16	26.90	57.58	73.32	10 9/16	33.18	87.62	111.6
8 5/8	27.10	58.43	74.39	10 5/8	33.38	88.66	112.9
8 11/16	27.29	59.28	75.47	10 11/16	33.58	89.71	114.2
8 3/4	27.49	60.13	76.56	10 3/4	33.77	90.76	115.6
8 13/16	27.69	60.99	77.66	10 13/16	33.97	91.82	116.9
8 7/8	27.88	61.86	78.77	10 7/8	34.16	92.89	118.3
8 15/16	28.08	62.74	79.88	10 15/16	34.36	93.96	119.6
9	28.27	63.62	81.00	11	34.56	95.03	121.0
9 1/16	28.47	64.50	82.13	11 1/16	34.75	96.12	122.4
9 1/8	28.67	65.40	83.27	11 1/8	34.95	97.20	123.8
9 3/16	28.86	66.30	84.41	11 3/16	35.15	98.30	125.2
9 1/4	29.06	67.20	85.56	11 1/4	35.34	99.40	126.6
9 5/16	29.26	68.11	86.72	11 5/16	35.54	100.5	128.0
9 3/8	29.45	69.03	87.89	11 3/8	35.74	101.6	129.4
9 7/16	29.65	69.95	89.07	11 7/16	35.93	102.7	130.8
9 1/2	29.85	70.88	90.25	11 1/2	36.13	103.9	132.3
9 9/16	30.04	71.82	91.44	11 9/16	36.32	105.0	133.7
9 5/8	30.24	72.76	92.64	11 5/8	36.52	106.1	135.1
9 11/16	30.43	73.71	93.85	11 11/16	36.72	107.3	136.6
9 3/4	30.63	74.66	95.06	11 3/4	36.91	108.4	138.1
9 13/16	30.83	75.62	96.29	11 13/16	37.11	109.6	139.5
9 7/8	31.02	76.59	97.52	11 7/8	37.31	110.8	141.0
9 15/16	31.22	77.56	98.75	11 15/16	37.50	111.9	142.5

CIRCLES

Circumferences and Areas

Diam.		Circum.		Area	Diam.		Circum.		Area
Ft.	In.	Ft.	In.	Sq. Ft.	Ft.	In.	Ft.	In.	Sq. Ft.
1	0	3	1¾	.7854	1	6	4	8½	1.767
1	0⅛	3	2⅛	.8018	1	6⅛	4	9	1.792
1	0¼	3	2½	.8185	1	6¼	4	9⅜	1.817
1	0⅜	3	2⅞	.8353	1	6⅜	4	9¾	1.842
1	0½	3	3¼	.8522	1	6½	4	10⅛	1.867
1	0⅝	3	3⅝	.8693	1	6⅝	4	10½	1.892
1	0¾	3	4	.8866	1	6¾	4	10⅞	1.917
1	0⅞	3	4½	.9041	1	6⅞	4	11¼	1.943
1	1	3	4⅞	.9218	1	7	4	11¾	1.969
1	1⅛	3	5¼	.9396	1	7⅛	5	0⅛	1.995
1	1¼	3	5⅝	.9575	1	7¼	5	0½	2.021
1	1⅜	3	6	.9757	1	7⅜	5	0⅞	2.047
1	1½	3	6⅜	.9940	1	7½	5	1¼	2.074
1	1⅝	3	6¾	1.013	1	7⅝	5	1⅝	2.101
1	1¾	3	7¼	1.031	1	7¾	5	2	2.127
1	1⅞	3	7⅝	1.050	1	7⅞	5	2½	2.154
1	2	3	8	1.069	1	8	5	2⅞	2.182
1	2⅛	3	8⅜	1.088	1	8⅛	5	3¼	2.209
1	2¼	3	8¾	1.108	1	8¼	5	3⅝	2.237
1	2⅜	3	9⅛	1.127	1	8⅜	5	4	2.264
1	2½	3	9½	1.147	1	8½	5	4⅜	2.292
1	2⅝	3	10	1.167	1	8⅝	5	4¾	2.320
1	2¾	3	10⅜	1.187	1	8¾	5	5¼	2.348
1	2⅞	3	10¾	1.207	1	8⅞	5	5⅝	2.377
1	3	3	11⅛	1.227	1	9	5	6	2.405
1	3⅛	3	11½	1.248	1	9⅛	5	6⅜	2.434
1	3¼	3	11⅞	1.268	1	9¼	5	6¾	2.463
1	3⅜	4	0¼	1.289	1	9⅜	5	7⅛	2.492
1	3½	4	0¾	1.310	1	9½	5	7½	2.521
1	3⅝	4	1⅛	1.332	1	9⅝	5	7⅞	2.551
1	3¾	4	1½	1.353	1	9¾	5	8⅜	2.580
1	3⅞	4	1⅞	1.375	1	9⅞	5	8¾	2.610
1	4	4	2¼	1.396	1	10	5	9⅛	2.640
1	4⅛	4	2⅝	1.418	1	10⅛	5	9½	2.670
1	4¼	4	3	1.440	1	10¼	5	9⅞	2.700
1	4⅜	4	3½	1.462	1	10⅜	5	10¼	2.731
1	4½	4	3⅞	1.485	1	10½	5	10⅝	2.761
1	4⅝	4	4¼	1.507	1	10⅝	5	11⅛	2.792
1	4¾	4	4⅝	1.530	1	10¾	5	11½	2.823
1	4⅞	4	5	1.553	1	10⅞	5	11⅞	2.854
1	5	4	5⅜	1.576	1	11	6	0¼	2.885
1	5⅛	4	5¾	1.600	1	11⅛	6	0⅝	2.917
1	5¼	4	6¼	1.623	1	11¼	6	1	2.948
1	5⅜	4	6⅝	1.647	1	11⅜	6	1⅜	2.980
1	5½	4	7	1.670	1	11½	6	1⅞	3.012
1	5⅝	4	7⅜	1.694	1	11⅝	6	2¼	3.044
1	5¾	4	7¾	1.718	1	11¾	6	2⅝	3.076
1	5⅞	4	8⅛	1.743	1	11⅞	6	3	3.109

CIRCLES

Circumferences and Areas

Diam.		Circum.		Area	Diam.		Circum.		Area
Ft.	In.	Ft.	In.	Sq. Ft.	Ft.	In.	Ft.	In.	Sq. Ft.
2	0	6	3⅜	3.142	3	0	9	5⅛	7.069
2	0¼	6	4⅛	3.207	3	0¼	9	5⅞	7.167
2	0½	6	5	3.274	3	0½	9	6⅝	7.266
2	0¾	6	5¾	3.341	3	0¾	9	7½	7.366
2	1	6	6½	3.409	3	1	9	8¼	7.467
2	1¼	6	7⅜	3.477	3	1¼	9	9	7.568
2	1½	6	8⅛	3.547	3	1½	9	9¾	7.670
2	1¾	6	8⅞	3.616	3	1¾	9	10⅝	7.772
2	2	6	9⅝	3.687	3	2	9	11⅜	7.876
2	2¼	6	10½	3.758	3	2¼	10	0⅛	7.980
2	2½	6	11¼	3.830	3	2½	10	1	8.084
2	2¾	7	0	3.903	3	2¾	10	1¾	8.190
2	3	7	0⅞	3.976	3	3	10	2½	8.296
2	3¼	7	1⅝	4.050	3	3¼	10	3¼	8.402
2	3½	7	2⅜	4.125	3	3½	10	4⅛	8.510
2	3¾	7	3⅛	4.200	3	3¾	10	4⅞	8.618
2	4	7	4	4.276	3	4	10	5⅝	8.727
2	4¼	7	4¾	4.353	3	4¼	10	6½	8.836
2	4½	7	5½	4.430	3	4½	10	7¼	8.946
2	4¾	7	6⅜	4.508	3	4¾	10	8	9.057
2	5	7	7⅛	4.587	3	5	10	8¾	9.168
2	5¼	7	7⅞	4.666	3	5¼	10	9⅝	9.281
2	5½	7	8⅝	4.746	3	5½	10	10⅜	9.393
2	5¾	7	9½	4.827	3	5¾	10	11⅛	9.507
2	6	7	10¼	4.909	3	6	11	0	9.621
2	6¼	7	11	4.991	3	6¼	11	0¾	9.736
2	6½	7	11⅞	5.074	3	6½	11	1½	9.852
2	6¾	8	0⅝	5.157	3	6¾	11	2¼	9.968
2	7	8	1⅜	5.241	3	7	11	3⅛	10.08
2	7¼	8	2⅛	5.326	3	7¼	11	3⅞	10.20
2	7½	8	3	5.412	3	7½	11	4⅝	10.32
2	7¾	8	3¾	5.498	3	7¾	11	5½	10.44
2	8	8	4½	5.585	3	8	11	6¼	10.56
2	8¼	8	5⅜	5.673	3	8¼	11	7	10.68
2	8½	8	6⅛	5.761	3	8½	11	7¾	10.80
2	8¾	8	6⅞	5.850	3	8¾	11	8⅝	10.92
2	9	8	7⅝	5.940	3	9	11	9⅜	11.04
2	9¼	8	8½	6.030	3	9¼	11	10⅛	11.17
2	9½	8	9¼	6.121	3	9½	11	11	11.29
2	9¾	8	10	6.213	3	9¾	11	11¾	11.42
2	10	8	10⅞	6.305	3	10	12	0½	11.54
2	10¼	8	11⅝	6.398	3	10¼	12	1¼	11.67
2	10½	9	0⅜	6.492	3	10½	12	2⅛	11.79
2	10¾	9	1⅛	6.586	3	10¾	12	2⅞	11.92
2	11	9	2	6.681	3	11	12	3⅝	12.05
2	11¼	9	2¾	6.777	3	11¼	12	4½	12.18
2	11½	9	3½	6.874	3	11½	12	5¼	12.31
2	11¾	9	4¼	6.971	3	11¾	12	6	12.44

CIRCLES

Circumferences and Areas

Diam.		Circum.		Area	Diam.		Circum.		Area
Ft.	In.	Ft.	In.	Sq. Ft.	Ft.	In.	Ft.	In.	Sq. Ft.
4	0	12	6¾	12.57	5	0	15	8½	19.63
4	0¼	12	7⅝	12.70	5	0¼	15	9¼	19.80
4	0½	12	8⅜	12.83	5	0½	15	10⅛	19.96
4	0¾	12	9⅛	12.96	5	0¾	15	10⅞	20.13
4	1	12	10	13.10	5	1	15	11⅝	20.29
4	1¼	12	10¾	13.23	5	1¼	16	0⅜	20.46
4	1½	12	11½	13.36	5	1½	16	1¼	20.63
4	1¾	13	0¼	13.50	5	1¾	16	2	20.80
4	2	13	1⅛	13.64	5	2	16	2¾	20.97
4	2¼	13	1⅞	13.77	5	2¼	16	3⅝	21.14
4	2½	13	2⅝	13.91	5	2½	16	4⅜	21.31
4	2¾	13	3⅜	14.05	5	2¾	16	5⅛	21.48
4	3	13	4¼	14.19	5	3	16	5⅞	21.65
4	3¼	13	5	14.33	5	3¼	16	6¾	21.82
4	3½	13	5¾	14.47	5	3½	16	7½	21.99
4	3¾	13	6⅝	14.61	5	3¾	16	8¼	22.17
4	4	13	7⅜	14.75	5	4	16	9	22.34
4	4¼	13	8⅛	14.89	5	4¼	16	9⅞	22.52
4	4½	13	8⅞	15.03	5	4½	16	10⅝	22.69
4	4¾	13	9¾	15.18	5	4¾	16	11⅜	22.87
4	5	13	10½	15.32	5	5	17	0¼	23.04
4	5¼	13	11¼	15.47	5	5¼	17	1	23.22
4	5½	14	0⅛	15.61	5	5½	17	1¾	23.40
4	5¾	14	0⅞	15.76	5	5¾	17	2½	23.58
4	6	14	1⅝	15.90	5	6	17	3⅜	23.76
4	6¼	14	2⅜	16.05	5	6¼	17	4⅛	23.94
4	6½	14	3¼	16.20	5	6½	17	4⅞	24.12
4	6¾	14	4	16.35	5	6¾	17	5¾	24.30
4	7	14	4¾	16.50	5	7	17	6½	24.48
4	7¼	14	5⅝	16.65	5	7¼	17	7¼	24.67
4	7½	14	6⅜	16.80	5	7½	17	8	24.85
4	7¾	14	7⅛	16.95	5	7¾	17	8⅞	25.03
4	8	14	7⅞	17.10	5	8	17	9⅝	25.22
4	8¼	14	8¾	17.26	5	8¼	17	10⅜	25.41
4	8½	14	9½	17.41	5	8½	17	11¼	25.59
4	8¾	14	10¼	17.57	5	8¾	18	0	25.78
4	9	14	11⅛	17.72	5	9	18	0¾	25.97
4	9¼	14	11⅞	17.88	5	9¼	18	1½	26.16
4	9½	15	0⅝	18.03	5	9½	18	2⅜	26.34
4	9¾	15	1⅜	18.19	5	9¾	18	3⅛	26.53
4	10	15	2¼	18.35	5	10	18	3⅞	26.73
4	10¼	15	3	18.51	5	10¼	18	4¾	26.92
4	10½	15	3¾	18.67	5	10½	18	5½	27.11
4	10¾	15	4⅝	18.83	5	10¾	18	6¼	27.30
4	11	15	5⅜	18.99	5	11	18	7	27.49
4	11¼	15	6⅛	19.15	5	11¼	18	7⅞	27.69
4	11½	15	6⅞	19.31	5	11½	18	8⅝	27.88
4	11¾	15	7¾	19.47	5	11¾	18	9⅜	28.08

CIRCLES

Circumferences and Areas

Diam.		Circum.		Area	Diam.		Circum.		Area
Ft.	In.	Ft.	In.	Sq. Ft.	Ft.	In.	Ft.	In.	Sq. Ft.
6	0	18	10¼	28.27	7	0	21	11⅞	38.48
6	0¼	18	11	28.47	7	1	22	3	39.41
6	0½	18	11¾	28.67	7	2	22	6⅛	40.34
6	0¾	19	0½	28.87	7	3	22	9⅜	41.28
6	1	19	1⅜	29.07	7	4	23	0½	42.24
6	1¼	19	2⅛	29.26	7	5	23	3⅝	43.20
6	1½	19	2⅞	29.46	7	6	23	6¾	44.18
6	1¾	19	3¾	29.67	7	7	23	9⅞	45.17
6	2	19	4½	29.87	7	8	24	1	46.16
6	2¼	19	5¼	30.07	7	9	24	4⅛	47.17
6	2½	19	6	30.27	7	10	24	7¼	48.19
6	2¾	19	6⅞	30.48	7	11	24	10½	49.22
6	3	19	7⅝	30.68	8	0	25	1⅝	50.27
6	3¼	19	8⅜	30.88	8	1	25	4¾	51.32
6	3½	19	9¼	31.09	8	2	25	7⅞	52.38
6	3¾	19	10	31.30	8	3	25	11	53.46
6	4	19	10¾	31.50	8	4	26	2⅛	54.54
6	4¼	19	11½	31.71	8	5	26	5¼	55.64
6	4½	20	0⅜	31.92	8	6	26	8½	56.74
6	4¾	20	1⅛	32.13	8	7	26	11⅝	57.86
6	5	20	1⅞	32.34	8	8	27	2¾	58.99
6	5¼	20	2¾	32.55	8	9	27	5⅞	60.13
6	5½	20	3½	32.76	8	10	27	9	61.28
6	5¾	20	4¼	32.97	8	11	28	0⅛	62.44
6	6	20	5	33.18	9	0	28	3¼	63.62
6	6¼	20	5⅞	33.40	9	1	28	6⅜	64.80
6	6½	20	6⅝	33.61	9	2	28	9⅝	66.00
6	6¾	20	7⅜	33.82	9	3	29	0¾	67.20
6	7	20	8⅛	34.04	9	4	29	3⅞	68.42
6	7¼	20	9	34.26	9	5	29	7	69.64
6	7½	20	9¾	34.47	9	6	29	10⅛	70.88
6	7¾	20	10½	34.69	9	7	30	1¼	72.13
6	8	20	11⅜	34.91	9	8	30	4⅜	73.39
6	8¼	21	0⅛	35.13	9	9	30	7⅝	74.66
6	8½	21	0⅞	35.34	9	10	30	10¾	75.94
6	8¾	21	1⅝	35.56	9	11	31	1⅞	77.24
6	9	21	2½	35.78	10	0	31	5	78.54
6	9¼	21	3¼	36.01	10	1	31	8⅛	79.85
6	9½	21	4	36.23	10	2	31	11¼	81.18
6	9¾	21	4⅞	36.45	10	3	32	2⅜	82.52
6	10	21	5⅝	36.67	10	4	32	5½	83.86
6	10¼	21	6⅜	36.90	10	5	32	8¾	85.22
6	10½	21	7⅛	37.12	10	6	32	11⅞	86.59
6	10¾	21	8	37.35	10	7	33	3	87.97
6	11	21	8¾	37.57	10	8	33	6⅛	89.36
6	11¼	21	9½	37.80	10	9	33	9¼	90.76
6	11½	21	10⅜	38.03	10	10	34	0⅜	92.18
6	11¾	21	11⅛	38.26	10	11	34	3½	93.60

RECTANGULAR TANKS

Capacity in U. S. Gallons Per Foot of Depth

Widths Feet	Length of Tank—in Feet						
	2	2½	3	3½	4	4½	5
2	29.92	37.40	44.88	52.36	59.84	67.32	74.81
2½	—	46.75	56.10	65.45	74.81	84.16	93.51
3	—	—	67.32	78.55	89.77	101.0	112.2
3½	—	—	—	91.64	104.7	117.8	130.9
4	—	—	—	—	119.7	134.6	149.6
4½	—	—	—	—	—	151.5	168.3
5	—	—	—	—	—	—	187.0
	5½	6	6½	7	7½	8	8½
2	82.29	89.77	97.25	104.7	112.2	119.7	127.2
2½	102.9	112.2	121.6	130.9	140.3	149.6	159.0
3	123.4	134.6	145.9	157.1	168.3	179.5	190.8
3½	144.0	157.1	170.2	183.3	196.4	209.5	222.5
4	164.6	179.5	194.5	209.5	224.4	239.4	254.3
4½	185.1	202.0	218.8	235.6	252.5	269.3	286.1
5	205.7	224.4	243.1	261.8	280.5	299.2	317.9
5½	226.3	246.9	267.4	288.0	308.6	329.1	349.7
6	—	269.3	291.7	314.2	336.6	359.1	381.5
6½	—	—	316.1	340.4	364.7	389.0	413.3
7	—	—	—	366.5	392.7	418.9	445.1
7½	—	—	—	—	420.8	448.8	476.9
8	—	—	—	—	—	478.8	508.7
8½	—	—	—	—	—	—	540.5
	9	9½	10	10½	11	11½	12
2	134.6	142.1	149.6	157.1	164.6	172.1	179.5
2½	168.3	177.7	187.0	196.4	205.7	215.1	224.4
3	202.0	213.2	224.4	235.6	246.9	258.1	269.3
3½	235.6	248.7	261.8	274.9	288.0	301.1	314.2
4	269.3	284.3	299.2	314.2	329.1	344.1	359.1
4½	303.0	319.8	336.6	353.5	370.3	387.1	403.9
5	336.6	355.3	374.0	392.7	411.4	430.1	448.8
5½	370.3	390.9	411.4	432.0	452.6	473.1	493.7
6	403.9	426.4	448.8	471.3	493.7	516.2	538.6
6½	437.6	461.9	486.2	510.5	534.9	559.2	583.5
7	471.3	497.5	523.6	549.8	576.0	602.2	628.4
7½	504.9	533.0	561.0	589.1	617.1	645.2	673.2
8	538.6	568.5	598.4	628.4	658.3	688.2	718.1
8½	572.3	604.1	635.8	667.6	699.4	731.2	763.0
9	605.9	639.6	673.2	706.9	740.6	774.2	807.9
9½	—	675.1	710.6	746.2	781.7	817.2	852.8
10	—	—	748.1	785.5	822.9	860.3	897.7
10½	—	—	—	824.7	864.0	903.3	942.5
11	—	—	—	—	905.1	946.3	987.4
11½	—	—	—	—	—	989.3	1032.
12	—	—	—	—	—	—	1077.

1 U. S. Gallon of water weighs 8.34523 Pounds Avoirdupois at 4° C.

CIRCULAR TANKS

Capacity in U. S. Gallons Per Foot of Depth

Diam. Ft.	In.	Gallons	Diam. Ft.	In.	Gallons	Diam. Ft.	In.	Gallons
1		5.875	3	6	71.97	5	11	205.7
1	1	6.895	3	7	75.44	6		211.5
1	2	7.997	3	8	78.99	6	3	229.5
1	3	9.180	3	9	82.62	6	6	248.2
1	4	10.44	3	10	86.33	6	9	267.7
1	5	11.79	3	11	90.13	7		287.9
1	6	13.22	4		94.00	7	3	308.8
1	7	14.73	4	1	97.96	7	6	330.5
1	8	16.32	4	2	102.0	7	9	352.9
1	9	17.99	4	3	106.1	8		376.0
1	10	19.75	4	4	110.3	8	3	399.9
1	11	21.58	4	5	114.6	8	6	424.5
2		23.50	4	6	119.0	8	9	449.8
2	1	25.50	4	7	123.4	9		475.9
2	2	27.58	4	8	127.9	9	3	502.7
2	3	29.74	4	9	132.6	9	6	530.2
2	4	31.99	4	10	137.3	9	9	558.5
2	5	34.31	4	11	142.0	10		587.5
2	6	36.72	5		146.9	10	3	617.3
2	7	39.21	5	1	151.8	10	6	647.7
2	8	41.78	5	2	156.8	10	9	679.0
2	9	44.43	5	3	161.9	11		710.9
2	10	47.16	5	4	167.1	11	3	743.6
2	11	49.98	5	5	172.4	11	6	777.0
3		52.88	5	6	177.7	11	9	811.1
3	1	55.86	5	7	183.2	12		846.0
3	2	58.92	5	8	188.7	12	3	881.6
3	3	62.06	5	9	194.2	12	6	918.0
3	4	65.28	5	10	199.9	12	9	955.1
3	5	68.58						

1 U. S. Gallon of water weighs 8.34523 Pounds Avoirdupois at 4° C.

CONVERSION TABLES

Weights and Measures

All tabular values containing less than 6 places of figures are constants. Thus, 1 meter = exactly 39.37 U. S. Inches.

Metric System

The "meter" is the metric unit of length; the "gram," of weight or mass; and the "liter," of capacity. All other metric units are the decimal subdivisions or multiples of these units, and are formed by adding the following prefixes to the words meter, gram, and liter. The meanings are as indicated.

milli-	=.001 of unit	deka-	=10. times unit
centi-	=.01 of unit	hecto-	=100. times unit
deci-	=.1 of unit	kilo-	=1000. times unit

Thus, centimeter = .01 meter; kilogram = 1000. grams; etc.

For all practical purposes 1 cubic decimeter equals 1 liter and 1 liter of water weighs 1 kilogram; but the tables herewith are based on the more accurate relationship that 1 liter = 1000.027 cubic centimeters.

United States-Metric

Basic Standards

1 meter = 39.37 inches.

1 liter = volume of 1 kilogram of pure water at its maximum density (at a temperature of 4°C, practically) and under the standard atmospheric pressure (of 760 millimeters of mercury).
= 1.000027 cubic decimeters (= 1000.027 cubic centimeters).

1 avoirdupois pound = 453.5924277 grams.

1 gallon = 231. cubic inches.

Equivalents

$\pi = 3.14159265$	$3\pi = 9.42478$	$\frac{1}{\pi} = 0.318310$	$\sqrt{2} = 1.41421$
$\frac{\pi}{4} = 0.785398$	$12\pi = 37.6991$	$\frac{4}{\pi} = 1.27324$	$\sqrt{3} = 1.73205$

Note—The small subnumeral on the opposite page following a zero indicates that the zero is to be taken that number of times; thus: $.0_5188$ is equivalent to .00000188 and 188160_3 is equivalent to 18816000.

CONVERSION TABLES

Length—United States-Metric

To Convert From	To Mils	To Inches	To Feet	To Milli-meters	To Centi-meters
	Multiply the Quantity to be Converted By				
Mil.....	1	0.001	$0.0_4833333$	0.02540005	0.002540005
Inch.....	1000.	1	0.0833333	25.40005	2.540005
Foot.....	12000.	12.	1	304.8006	30.48006
Mil'meter	39.37	0.03937	0.003280833	1	0.1
Cm.....	393.7	0.3937	0.03280833	10.	1

To Convert From	To Feet	To Yards	To Miles	To Meters	To Kilometers
	Multiply the Quantity to be Converted By				
Foot.....	1	0.333333	$0.0_31893939$	0.3048006	$0.0_33048006$
Yard....	3.	1	$0.0_3568182$	0.9144018	$0.0_39144018$
Mile.....	5280.	1760.	1	1609.3472	1.6093472
Meter...	3.280833	1.0936111	$0.0_36213699$	1	0.001
Kilometer	3280.833	1093.6111	0.6213699	1000.	1

Area—United States-Metric

To Convert From	To Circular Mils	To Circular Inches	To Square Inches	To Square Milimeters	To Square Cen'meters
	Multiply the Quantity to be Converted By				
Cir. Mil..	1	0.0_51	$0.0_6785398$	$0.0_3506710$	$0.0_5506710$
Cir. Inch	1000000.	1	0.785398	506.710	5.06710
Sq. Inch.	1273240.	1.27324	1	645.163	6.45163
Sq. Mm..	1973.52	0.00197352	0.00155000	1	0.01
Sq. Cm...	197352.	0.197352	0.155000	100.	1

To Convert From	To Square Inches	To Square Feet	To Square Yards	To Square Cen'meters	To Square Meters
	Multiply the Quantity to be Converted By				
Sq. Inch.	1	0.00694444	$0.0_3771605$	6.451626	$0.0_36451626$
Sq. Foot.	144.	1	0.1111111	929.0341	0.09290341
Sq. Yard.	1296.	9.	1	8361.307	0.8361307
Sq. Cm...	0.1549997	0.001076387	$0.0_31195985$	1	0.0_31
Sq. Meter	1549.9969	10.76387	1.195985	10000.	1

CONVERSION TABLES

Capacity, Liquid—United States-Metric

To Convert From	To Fluid Ounces	To Gallons	To Cubic Inches	To Liters	To Cubic Centim'rs
	Multiply the Quantity to be Converted by				
Fluid Ounce.	1	0.0078125	1.80469	0.0295729	29.5737
Gallon.....	128.	1	231.	3.785332	3785.43
Cubic Inch .	0.554113	0.00432900	1	0.0163867	16.3872
Liter.....	33.8147	0.264178	61.0250	1	1000.027
Cu. Cm.....	0.0338138	$0.0_3264170$	0.0610234	$0.0_3999973$	1

Volume—United States-Metric

To Convert From	To Cubic Inches	To Cubic Feet	To Cubic Yards	To Cubic Cms.	To Cubic Meters
	Multiply the Quantity to be Converted by				
Cubic Inch.	1	$0.0_3578704$	$0.0_42143347$	16.387162	$0.0_41638716$
Cubic Foot.	1728.	1	0.0370370	28317.016	0.028317016
Cubic Yard	46656.	27.	1	764559.4	0.7645594
Cubic Cm.	0.06102338	$0.0_43531445$	$0.0_5130794$	1	0.0_51
Cubic Meter	61023.38	35.31445	1.3079428	1000000.	1

Note—The small subnumeral following a zero indicates that the zero is to be taken that number of times; thus, $.0_5188$ is equivalent to .00000188 and 188160_3 is equivalent to 18816000.

CONVERSION TABLES

Mass or Weight—United States-Metric

To Convert From	To Grains	To Avoirdupois Ounces	To Avoirdupois Pounds	To Grams	To Kilograms
	Multiply the Quantity to be Converted by				
Grain	1	0.00228571	$0.0_31428571$	0.064798918	$0.0_4647989$
Avoirdupois Ounce	437.5	1	0.0625	28.349527	0.02834953
Avoirdupois Pound	7000.	16.	1	453.5924277	0.4535924277
Gram	15.432356	0.03527396	0.00220462	1	0.001
Kilogram	15432.356	35.27396	2.204622341	1000.	1

To Convert From	To Avoirdupois Pounds	To Short Tons	To Long Tons	To Kilograms	To Metric Tons
	Multiply the Quantity to be Converted by				
Avoirdupois Lb.	1	0.0_35	$0.0_34464286$	0.4535924277	$0.0_345359243$
Short Ton	2000.	1	0.8928571	907.18486	0.90718486
Long Ton	2240.	1.12	1	1016.04704	1.01604704
Kilogram	2.20462234	0.0011023112	$0.0_39842064$	1	0.001
Met. Ton	2204.62234	1.1023112	0.98420640	1000.	1

Miscellaneous Equivalents—United States—Metric

1 liquid quart = 0.859367 dry quart.

1 dry quart = 1.16365 liquid quarts.

1 ounce, apothecaries' or troy =
480. grains = 1.09714 avoirdupois ounces.

1 pound, apothecaries' or troy =
12. ounces, troy = 0.822857 avoirdupois pound.

1 pound per square inch =
0.000703067 kilogram per square millimeter.

1 kilogram per square millimeter =
1422.34 pounds per square inch.

1 pound per cubic inch = 27.6797 grams per cubic centimeter.

1 gram per cubic centimeter = 0.0361275 pound per cubic inch.

CONVERSION TABLES

United States-British
Basic Standards

The United States-British conversion factors given below are derived from the United States-Metric and the British-Metric factors. The basic factors used are:

1 meter = 39.370113 British inches.

1 British gallon = 4.5459631 liters.

1 British pound = 0.45359243 kilogram.

(Note: The U. S. pound to 8 places is also equal to 0.45359243 kilogram)

Conversion Factors—United States-British

Unit	Relationship	
	United States	British
Length	1 Inch	= 1.0000029 Inches
	0.99999713 Inch	= 1 Inch
Area	1 Square Inch	= 1.0000057 Square Inches
	0.99999426 Square Inch	= 1 Square Inch
Volume	1 Cubic Inch	= 1.0000086 Cubic Inches
	0.99999140 Cubic Inch	= 1 Cubic Inch
Capacity—Liquid	1 Gallon	= 0.8326799 Gallon
	1.2009416 Gallons	= 1 Gallon
Mass	1.0000000 Pound	= 1.0000000 Pound

Miscellaneous Equivalents—United States—British

1 U.S. mile =
1760. U.S. yards = 5280. U.S. feet = 63360. U.S. inches.

1 Brit. mile =
1760. Brit. yards = 5280. Brit. feet = 63360. Brit. inches.

1 U.S. gallon =
4. U.S. quarts = 8. U.S. pints = 32. U.S. gills = 128. U.S. fluid ounces.

1 Brit. gallon =
4. Brit. quarts = 8. Brit. pints = 32. Brit. gills = 160. Brit. fluid ounces.

1 U.S. short ton =
20. U.S. short hundredweight = 2000. U.S. pounds.

1 U.S. long ton =
20. U.S. long hundredweight = 2240. U.S. pounds.

1 Brit. ton =
20. Brit. hundredweight = 2240. Brit. pounds.

TEMPERATURE TABLES

The column in bold face refers to the given temperature either in degrees Centigrade or Fahrenheit. The equivalent will be the corresponding figure in the column to which the conversion is being made.

C.		F.	C.		F.	C.		F.	C.		F.
149	**300**	572	432	**810**	1490	716	**1320**	2408	999	**1830**	3326
154	**310**	590	438	**820**	1508	721	**1330**	2426	1004	**1840**	3344
160	**320**	608	443	**830**	1526	727	**1340**	2444	1010	**1850**	3362
166	**330**	626	449	**840**	1544	732	**1350**	2462	1016	**1860**	3380
171	**340**	644	454	**850**	1562	738	**1360**	2480	1021	**1870**	3398
177	**350**	662	460	**860**	1580	743	**1370**	2498	1027	**1880**	3416
182	**360**	680	466	**870**	1598	749	**1380**	2516	1032	**1890**	3434
188	**370**	698	471	**880**	1616	754	**1390**	2534	1038	**1900**	3452
193	**380**	716	477	**890**	1634	760	**1400**	2552	1043	**1910**	3470
199	**390**	734	482	**900**	1652	766	**1410**	2570	1049	**1920**	3488
204	**400**	752	488	**910**	1670	771	**1420**	2588	1054	**1930**	3506
210	**410**	770	493	**920**	1688	777	**1430**	2606	1060	**1940**	3524
216	**420**	788	499	**930**	1706	782	**1440**	2624	1066	**1950**	3542
221	**430**	806	504	**940**	1724	788	**1450**	2642	1071	**1960**	3560
227	**440**	824	510	**950**	1742	793	**1460**	2660	1077	**1970**	3578
232	**450**	842	516	**960**	1760	799	**1470**	2678	1082	**1980**	3596
238	**460**	860	521	**970**	1778	804	**1480**	2696	1088	**1990**	3614
243	**470**	878	527	**980**	1796	810	**1490**	2714	1093	**2000**	3632
249	**480**	896	532	**990**	1814	816	**1500**	2732	1099	**2010**	3650
254	**490**	914	538	**1000**	1832	821	**1510**	2750	1104	**2020**	3668
260	**500**	932	543	**1010**	1850	827	**1520**	2768	1110	**2030**	3686
266	**510**	950	549	**1020**	1868	832	**1530**	2786	1116	**2040**	3704
271	**520**	968	554	**1030**	1886	838	**1540**	2804	1121	**2050**	3722
277	**530**	986	560	**1040**	1904	843	**1550**	2822	1127	**2060**	3740
282	**540**	1004	566	**1050**	1922	849	**1560**	2840	1132	**2070**	3758
288	**550**	1022	571	**1060**	1940	854	**1570**	2858	1138	**2080**	3776
293	**560**	1040	577	**1070**	1958	860	**1580**	2876	1143	**2090**	3794
299	**570**	1058	582	**1080**	1976	866	**1590**	2894	1149	**2100**	3812
304	**580**	1076	588	**1090**	1994	871	**1600**	2912	1154	**2110**	3830
310	**590**	1094	593	**1100**	2012	877	**1610**	2930	1160	**2120**	3848
316	**600**	1112	599	**1110**	2030	882	**1620**	2948	1166	**2130**	3866
321	**610**	1130	604	**1120**	2048	888	**1630**	2966	1171	**2140**	3884
327	**620**	1148	610	**1130**	2066	893	**1640**	2984	1177	**2150**	3902
332	**630**	1166	616	**1140**	2084	899	**1650**	3002	1182	**2160**	3920
338	**640**	1184	621	**1150**	2102	904	**1660**	3020	1188	**2170**	3938
343	**650**	1202	627	**1160**	2120	910	**1670**	3038	1193	**2180**	3956
349	**660**	1220	632	**1170**	2138	916	**1680**	3056	1199	**2190**	3974
354	**670**	1238	638	**1180**	2156	921	**1690**	3074	1204	**2200**	3992
360	**680**	1256	643	**1190**	2174	927	**1700**	3092	1210	**2210**	4010
366	**690**	1274	649	**1200**	2192	932	**1710**	3110	1216	**2220**	4028
371	**700**	1292	654	**1210**	2210	938	**1720**	3128	1221	**2230**	4046
377	**710**	1310	660	**1220**	2228	943	**1730**	3146	1227	**2240**	4064
382	**720**	1328	666	**1230**	2246	949	**1740**	3164	1232	**2250**	4082
388	**730**	1346	671	**1240**	2264	954	**1750**	3182	1238	**2260**	4100
393	**740**	1364	677	**1250**	2282	960	**1760**	3200	1243	**2270**	4118
399	**750**	1382	682	**1260**	2300	966	**1770**	3218	1249	**2280**	4136
404	**760**	1400	688	**1270**	2318	971	**1780**	3236	1254	**2290**	4154
410	**770**	1418	693	**1280**	2336	977	**1790**	3254	1260	**2300**	4172
416	**780**	1436	699	**1290**	2354	982	**1800**	3272	1266	**2310**	4190
421	**790**	1454	704	**1300**	2372	988	**1810**	3290	1271	**2320**	4208
427	**800**	1472	710	**1310**	2390	993	**1820**	3308	1277	**2330**	4226

Conversion Formulas

Temperature °F.= (9/5 x °C.) + 32°. Temperature °C.= 5/9 (°F.−32°)

INCHES AND EQUIVALENTS IN MILLIMETERS

Inches	MM	Inches	MM	Inches	MM
1/64	.397	45/64	17.859	26	660.4
1/32	.794	23/32	18.256	27	685.8
3/64	1.191	47/64	18.653	28	711.2
1/16	1.588	3/4	19.050	29	736.6
5/64	1.984	49/64	19.447	30	762.0
3/32	2.381	25/32	19.844	31	787.4
7/64	2.778	51/64	20.241	32	812.8
1/8	3.175	13/16	20.638	33	838.2
9/64	3.572	53/64	21.034	34	863.6
5/32	3.969	27/32	21.431	35	889.0
11/64	4.366	55/64	21.828	36	914.4
3/16	4.763	7/8	22.225	37	939.8
13/64	5.159	57/64	22.622	38	965.2
7/32	5.556	29/32	23.019	39	990.6
15/64	5.953	59/64	23.416	40	1016.0
1/4	6.350	15/16	23.813	41	1041.4
17/64	6.747	61/64	24.209	42	1066.8
9/32	7.144	31/32	24.606	43	1092.2
19/64	7.540	63/64	25.003	44	1117.6
5/16	7.938	1	25.400	45	1143.0
21/64	8.334	2	50.8	46	1168.4
11/32	8.731	3	76.2	47	1193.8
23/64	9.128	4	101.6	48	1219.2
3/8	9.525	5	127.0	49	1244.6
25/64	9.922	6	152.4	50	1270.0
13/32	10.319	7	177.8	51	1295.4
27/64	10.716	8	203.2	52	1320.8
7/16	11.113	9	228.6	53	1346.2
29/64	11.509	10	254.0	54	1371.6
15/32	11.906	11	279.4	55	1397.0
31/64	12.303	12	304.8	56	1422.4
1/2	12.700	13	330.2	57	1447.8
33/64	13.097	14	355.6	58	1473.2
17/32	13.494	15	381.0	59	1498.6
35/64	13.891	16	406.4	60	1524.0
9/16	14.288	17	431.8	61	1549.4
37/64	14.684	18	457.2	62	1574.8
19/32	15.081	19	482.6	63	1600.2
39/64	15.478	20	508.0	64	1625.6
5/8	15.875	21	533.4	65	1651.0
41/64	16.272	22	558.8	66	1676.4
21/32	16.669	23	584.2	67	1701.8
43/64	17.066	24	609.6	68	1727.2
11/16	17.463	25	635.0	69	1752.6

INCHES AND EQUIVALENTS IN MILLIMETERS

Inches	MM	Inches	MM	Inches	MM
70	1778.0	114	2895.6	158	4013.2
71	1803.4	115	2921.0	159	4038.6
72	1828.8	116	2946.4	160	4064.0
73	1854.2	117	2971.8	161	4089.4
74	1879.6	118	2997.2	162	4114.8
75	1905.0	119	3022.6	163	4140.2
76	1930.4	120	3048.0	164	4165.6
77	1955.8	121	3073.4	165	4191.0
78	1981.2	122	3098.8	166	4216.4
79	2006.6	123	3124.2	167	4241.8
80	2032.0	124	3149.6	168	4267.2
81	2057.4	125	3175.0	169	4292.6
82	2082.8	126	3200.4	170	4318.0
83	2108.2	127	3225.8	171	4343.4
84	2133.6	128	3251.2	172	4368.8
85	2159.0	129	3276.6	173	4394.2
86	2184.4	130	3302.0	174	4419.6
87	2209.8	131	3327.4	175	4445.0
88	2235.2	132	3352.8	176	4470.4
89	2260.6	133	3378.2	177	4495.8
90	2286.0	134	3403.6	178	4521.2
91	2311.4	135	3429.0	179	4546.6
92	2336.8	136	3454.4	180	4572.0
93	2362.2	137	3479.8	181	4597.4
94	2387.6	138	3505.2	182	4622.8
95	2413.0	139	3530.6	183	4648.2
96	2438.4	140	3556.0	184	4673.6
97	2463.8	141	3581.4	185	4699.0
98	2489.2	142	3606.8	186	4724.4
99	2514.6	143	3632.2	187	4749.8
100	2540.0	144	3657.6	188	4775.2
101	2565.4	145	3683.0	189	4800.6
102	2590.8	146	3708.4	190	4826.0
103	2616.2	147	3733.8	191	4851.4
104	2641.6	148	3759.2	192	4876.8
105	2667.0	149	3784.6	193	4902.2
106	2692.4	150	3810.0	194	4927.6
107	2717.8	151	3835.4	195	4953.0
108	2743.2	152	3860.8	196	4978.4
109	2768.6	153	3886.2	197	5003.8
110	2794.0	154	3911.6	198	5029.2
111	2819.4	155	3937.0	199	5054.6
112	2844.8	156	3962.4	200	5080.0
113	2870.2	157	3987.8		

MILLIMETERS AND EQUIVALENTS IN INCHES

MM	Inches	MM	Inches	MM	Inches
1/100	.0004	45/100	.0177	89/100	.0350
2/100	.0008	46/100	.0181	90/100	.0354
3/100	.0012	47/100	.0185	91/100	.0358
4/100	.0016	48/100	.0189	92/100	.0362
5/100	.0020	49/100	.0193	93/100	.0366
6/100	.0024	50/100	.0197	94/100	.0370
7/100	.0028	51/100	.0201	95/100	.0374
8/100	.0031	52/100	.0205	96/100	.0378
9/100	.0035	53/100	.0209	97/100	.0382
10/100	.0039	54/100	.0213	98/100	.0386
11/100	.0043	55/100	.0217	99/100	.0390
12/100	.0047	56/100	.0221	1	.0394
13/100	.0051	57/100	.0224	2	.0787
14/100	.0055	58/100	.0228	3	.1181
15/100	.0059	59/100	.0232	4	.1575
16/100	.0063	60/100	.0236	5	.1969
17/100	.0067	61/100	.0240	6	.2362
18/100	.0071	62/100	.0244	7	.2756
19/100	.0075	63/100	.0248	8	.3150
20/100	.0079	64/100	.0252	9	.3543
21/100	.0083	65/100	.0256	10	.3937
22/100	.0087	66/100	.0260	11	.4331
23/100	.0091	67/100	.0264	12	.4724
24/100	.0094	68/100	.0268	13	.5118
25/100	.0098	69/100	.0272	14	.5512
26/100	.0102	70/100	.0276	15	.5906
27/100	.0106	71/100	.0280	16	.6299
28/100	.0110	72/100	.0284	17	.6693
29/100	.0114	73/100	.0287	18	.7087
30/100	.0118	74/100	.0291	19	.7480
31/100	.0122	75/100	.0295	20	.7874
32/100	.0126	76/100	.0299	21	.8268
33/100	.0130	77/100	.0303	22	.8661
34/100	.0134	78/100	.0307	23	.9055
35/100	.0138	79/100	.0311	24	.9449
36/100	.0142	80/100	.0315	25	.9843
37/100	.0146	81/100	.0319	26	1.0236
38/100	.0150	82/100	.0323	27	1.0630
39/100	.0154	83/100	.0327	28	1.1024
40/100	.0158	84/100	.0331	29	1.1417
41/100	.0161	85/100	.0335	30	1.1811
42/100	.0165	86/100	.0339	31	1.2205
43/100	.0169	87/100	.0343	32	1.2598
44/100	.0173	88/100	.0347	33	1.2992

MILLIMETERS AND EQUIVALENTS IN INCHES

MM	Inches	MM	Inches	MM	Inches
34	1.3386	78	3.0709	122	4.8031
35	1.3780	79	3.1102	123	4.8425
36	1.4173	80	3.1496	124	4.8819
37	1.4567	81	3.1890	125	4.9213
38	1.4961	82	3.2283	126	4.9606
39	1.5354	83	3.2677	127	5.0000
40	1.5748	84	3.3071	128	5.0394
41	1.6142	85	3.3465	129	5.0787
42	1.6535	86	3.3858	130	5.1181
43	1.6929	87	3.4252	131	5.1575
44	1.7323	88	3.4646	132	5.1968
45	1.7717	89	3.5039	133	5.2362
46	1.8110	90	3.5433	134	5.2756
47	1.8504	91	3.5827	135	5.3150
48	1.8898	92	3.6220	136	5.3543
49	1.9291	93	3.6614	137	5.3937
50	1.9685	94	3.7008	138	5.4331
51	2.0079	95	3.7402	139	5.4724
52	2.0472	96	3.7795	140	5.5118
53	2.0866	97	3.8189	141	5.5512
54	2.1260	98	3.8583	142	5.5905
55	2.1654	99	3.8976	143	5.6299
56	2.2047	100	3.9370	144	5.6693
57	2.2441	101	3.9764	145	5.7087
58	2.2835	102	4.0157	146	5.7480
59	2.3228	103	4.0551	147	5.7874
60	2.3622	104	4.0945	148	5.8268
61	2.4016	105	4.1339	149	5.8661
62	2.4409	106	4.1732	150	5.9055
63	2.4803	107	4.2126	151	5.9449
64	2.5197	108	4.2520	152	5.9842
65	2.5591	109	4.2913	153	6.0236
66	2.5984	110	4.3307	154	6.0630
67	2.6378	111	4.3701	155	6.1024
68	2.6772	112	4.4094	156	6.1417
69	2.7165	113	4.4488	157	6.1811
70	2.7559	114	4.4882	158	6.2205
71	2.7953	115	4.5276	159	6.2598
72	2.8346	116	4.5669	160	6.2992
73	2.8740	117	4.6063	161	6.3386
74	2.9134	118	4.6457	162	6.3779
75	2.9528	119	4.6850	163	6.4173
76	2.9921	120	4.7244	164	6.4567
77	3.0315	121	4.7638	165	6.4961

MILLIMETERS AND EQUIVALENTS IN INCHES

MM	Inches	MM	Inches	MM	Inches
166	6.5354	211	8.3071	256	10.079
167	6.5748	212	8.3464	257	10.118
168	6.6142	213	8.3858	258	10.157
169	6.6535	214	8.4252	259	10.197
170	6.6929	215	8.4646	260	10.236
171	6.7323	216	8.5039	261	10.276
172	6.7716	217	8.5433	262	10.315
173	6.8110	218	8.5827	263	10.354
174	6.8504	219	8.6220	264	10.394
175	6.8898	220	8.6614	265	10.433
176	6.9291	221	8.7008	266	10.472
177	6.9685	222	8.7401	267	10.512
178	7.0079	223	8.7795	268	10.551
179	7.0472	224	8.8189	269	10.591
180	7.0866	225	8.8583	270	10.630
181	7.1260	226	8.8976	271	10.669
182	7.1653	227	8.9370	272	10.709
183	7.2047	228	8.9764	273	10.748
184	7.2441	229	9.0157	274	10.787
185	7.2835	230	9.0551	275	10.827
186	7.3228	231	9.0945	276	10.866
187	7.3622	232	9.1338	277	10.905
188	7.4016	233	9.1732	278	10.945
189	7.4409	234	9.2126	279	10.984
190	7.4803	235	9.2520	280	11.024
191	7.5197	236	9.2913	281	11.063
192	7.5590	237	9.3307	282	11.102
193	7.5984	238	9.3701	283	11.142
194	7.6378	239	9.4094	284	11.181
195	7.6772	240	9.4488	285	11.220
196	7.7165	241	9.4882	286	11.260
197	7.7559	242	9.5275	287	11.299
198	7.7953	243	9.5669	288	11.339
199	7.8346	244	9.6063	289	11.378
200	7.8740	245	9.6457	290	11.417
201	7.9134	246	9.6850	291	11.457
202	7.9527	247	9.7244	292	11.496
203	7.9921	248	9.7638	293	11.535
204	8.0315	249	9.8031	294	11.575
205	8.0709	250	9.8425	295	11.614
206	8.1102	251	9.8819	296	11.654
207	8.1496	252	9.9212	297	11.693
208	8.1890	253	9.9606	298	11.732
209	8.2283	254	10.000	299	11.772
210	8.2677	255	10.039		

GAUGE NUMBERS AND MILLIMETER EQUIVALENTS

Gauge No.	Brown & Sharpe's		Stubs'	
	Inches	Millimeters	Inches	Millimeters
000000	.5800	14.732		
00000	.5165	13.119		
0000	.4600	11.684	.454	11.532
000	.4096	10.404	.425	10.795
00	.3648	9.266	.380	9.652
0	.3249	8.252	.340	8.636
1	.2893	7.348	.300	7.620
2	.2576	6.543	.284	7.214
3	.2294	5.827	.259	6.579
4	.2043	5.189	.238	6.045
5	.1819	4.620	.220	5.588
6	.1620	4.115	.203	5.156
7	.1443	3.665	.180	4.572
8	.1285	3.264	.165	4.191
9	.1144	2.906	.148	3.759
10	.1019	2.588	.134	3.404
11	.09074	2.305	.120	3.048
12	.08081	2.053	.109	2.769
13	.07196	1.828	.095	2.413
14	.06408	1.628	.083	2.108
15	.05707	1.450	.072	1.829
16	.05082	1.291	.065	1.651
17	.04526	1.150	.058	1.473
18	.04030	1.024	.049	1.245
19	.03589	.912	.042	1.067
20	.03196	.812	.035	.889
21	.02846	.723	.032	.813
22	.02535	.644	.028	.711
23	.02257	.573	.025	.635
24	.02010	.511	.022	.559
25	.01790	.455	.020	.508
26	.01594	.405	.018	.457
27	.01420	.361	.016	.406
28	.01264	.321	.014	.356
29	.01126	.286	.013	.330
30	.01003	.255	.012	.305
31	.008928	.227	.010	.254
32	.007950	.202	.009	.229
33	.007080	.180	.008	.203
34	.006305	.160	.007	.178
35	.005615	.143	.005	.127
36	.005000	.127	.004	.102
37	.004453	.113		
38	.003965	.101		
39	.003531	.090		
40	.003145	.080		
41	.002800	.071		
42	.002494	.063		
43	.002221	.056		
44	.001978	.050		

COMPARISON OF GAUGES

Gauge No.	American or Brown &Sharpe's	Birmingham or Stubs'	Washburn & Moen's	Imperial S.W.G.	London or Old English	United States Standard	Gauge No.
0000000			.4900	.500		.500	0000000
000000	.5800		.4615	.464		.46875	000000
00000	.5165		.4305	.432		.4375	00000
0000	.4600	.454	.3938	.400	.454	.40625	0000
000	.4096	.425	.3625	.372	.425	.375	000
00	.3648	.380	.3310	.348	.380	.34375	00
0	.3249	.340	.3065	.324	.340	.3125	0
1	.2893	.300	.2830	.300	.300	.28125	1
2	.2576	.284	.2625	.276	.284	.265625	2
3	.2294	.259	.2437	.252	.259	.25	3
4	.2043	.238	.2253	.232	.238	.234375	4
5	.1819	.220	.2070	.212	.220	.21875	5
6	.1620	.203	.1920	.192	.203	.203125	6
7	.1443	.180	.1770	.176	.180	.1875	7
8	.1285	.165	.1620	.160	.165	.171875	8
9	.1144	.148	.1483	.144	.148	.15625	9
10	.1019	.134	.1350	.128	.134	.140625	10
11	.09074	.120	.1205	.116	.120	.125	11
12	.08081	.109	.1055	.104	.109	.109375	12
13	.07196	.095	.0915	.092	.095	.09375	13
14	.06408	.083	.0800	.080	.083	.078125	14
15	.05707	.072	.0720	.072	.072	.0703125	15
16	.05082	.065	.0625	.064	.065	.0625	16
17	.04526	.058	.0540	.056	.058	.05625	17
18	.04030	.049	.0475	.048	.049	.05	18
19	.03589	.042	.0410	.040	.040	.04375	19
20	.03196	.035	.0348	.036	.035	.0375	20
21	.02846	.032	.0317	.032	.0315	.034375	21
22	.02535	.028	.0286	.028	.0295	.03125	22
23	.02257	.025	.0258	.024	.0270	.028125	23
24	.02010	.022	.0230	.022	.0250	.025	24
25	.01790	.020	.0204	.020	.0230	.021875	25
26	.01594	.018	.0181	.018	.0205	.01875	26
27	.01420	.016	.0173	.0164	.01875	.0171875	27
28	.01264	.014	.0162	.0148	.01650	.015625	28
29	.01126	.013	.0150	.0136	.01550	.0140625	29
30	.01003	.012	.0140	.0124	.01375	.0125	30
31	.008928	.010	.0132	.0116	.01225	.0109375	31
32	.007950	.009	.0128	.0108	.01125	.01015625	32
33	.007080	.008	.0118	.0100	.01025	.009375	33
34	.006305	.007	.0104	.0092	.00950	.00859375	34
35	.005615	.005	.0095	.0084	.00900	.0078125	35
36	.005000	.004	.0090	.0076	.00750	.00703125	36
37	.004453		.0085	.0068	.00650	.006640625	37
38	.003965		.0080	.0060	.00575	.00625	38
39	.003531		.0075	.0052	.00500		39
40	.003145		.0070	.0048	.00450		40
41	.002800		.0066	.0044			41
42	.002494		.0062	.0040			42
43	.002221		.0060	.0036			43
44	.001978		.0058	.0032			44
45	.001761		.0055	.0028			45
46	.001568		.0052	.0024			46
47	.001397		.0050	.0020			47
48	.001244		.0048	.0016			48
49	.001108		.0046	.0012			49
50	.0009863		.0044	.0010			50

FRACTIONS and DECIMAL EQUIVALENTS

Fractions				Decimal Equiv.	Fractions				Decimal Equiv.
....	....	....	1/64	.015625	....	....	....	33/64	.515625
....	....	1/32	....	.03125	....	....	17/32	....	.53125
....	....	....	3/64	.046875	....	....	....	35/64	.546875
....	1/16	....	....	.0625	....	9/16	....	....	.5625
....	....	....	5/64	.078125	....	....	....	37/64	.578125
....	....	3/32	....	.09375	....	....	19/32	....	.59375
....	....	....	7/64	.109375	....	....	....	39/64	.609375
1/8	....	....	....	.125	5/8	....	....	....	.625
....	....	....	9/64	.140625	....	....	....	41/64	.640625
....	....	5/32	....	.15625	....	....	21/32	....	.65625
....	....	....	11/64	.171875	....	....	....	43/64	.671875
....	3/16	....	....	.1875	....	11/16	....	....	.6875
....	....	....	13/64	.203125	....	....	....	45/64	.703125
....	....	7/32	....	.21875	....	....	23/32	....	.71875
....	....	....	15/64	.234375	....	....	....	47/64	.734375
1/4	....	....	....	.250	3/4	....	....	....	.750
....	....	....	17/64	.265625	....	....	....	49/64	.765625
....	....	9/32	....	.28125	....	....	25/32	....	.78125
....	....	....	19/64	.296875	....	....	....	51/64	.796875
....	5/16	....	....	.3125	....	13/16	....	....	.8125
....	....	....	21/64	.328125	....	....	....	53/64	.828125
....	....	11/32	....	.34375	....	....	27/32	....	.84375
....	....	....	23/64	.359375	....	....	....	55/64	.859375
3/8	....	....	....	.375	7/8	....	....	....	.875
....	....	....	25/64	.390625	....	....	....	57/64	.890625
....	....	13/32	....	.40625	....	....	29/32	....	.90625
....	....	....	27/64	.421875	....	....	....	59/64	.921875
....	7/16	....	....	.4375	....	15/16	....	....	.9375
....	....	....	29/64	.453125	....	....	....	61/64	.953125
....	....	15/32	....	.46875	....	....	31/32	....	.96875
....	....	....	31/64	.484375	....	....	....	63/64	.984375
1/2	....	....	....	.500	1	....	....	....	1.0000

MEMORANDA

CHEMICAL AND PHYSICAL PROPERTIES

n purposes because they are subject to manufacturing limi

Composition, ent.		Tensile Strength, Lbs./Sq. In.		Elongation, Per Cent. in 2 In.		(g) Yield Point, Lbs./Sq. In.		Young's Modulus of Elasticity P.S.I. x 10^{-6}	
Lead	Tin	Hard (a)	Soft	Hard (a)	Soft	Hard (a)	Soft	Hard (a)	H
1.50		80,000	45,000	4	40				
2.00		70,000	50,000	10	45	31,000	22,000		
3.00		62,000	47,000	20	60	52,000	32,000	15.0	
	1.25	80,000	45,000	4	40				
	1.00	95,000	45,000	5	60				
	1.00		55,000		60				
	0.75	62,000	54,000	25	40				
	0.75	75,000	54,000	25	50	60,000	25,000	15.0	
	0.75	90,000	54,000	4	40		25,000		
	0.25		49,000		43*e*				
	1.25	65,000	40,000	4	48				
	1.75	100,000	50,000	3*e*	33*e*				
	3.75	90,000	45,000	4	50		18,300	15.0	
	5.00	100,000	50,000	3	55	87,000	23,000	15.0	
1.00	5.00		50,000		40		20,000		
	8.00	110,000	55,000	3	70	85,000	25,000	14.0	
	10.50	115,000	60,000	5	65	95,000	40,000		1
4.00	4.00	60,000		20		50,000		15.0	
Nickel	2.00	120,000	45,000	3*e*	36				
30.00			65,000		30				
20.00		85,000	50,000	2	30				
15.00		70,000	45,000	3	30	51,000			
30.00		130,000	72,000	2	35				
30.00		160,000	75,000	1*e*	35*e*				
30.00		105,000	65,000	2	30				
30.00		85,000	65,000	10	30			20.0	
30.00		130,000	65,000	2*e*	30				
25.00		110,000	72,000	4	30				
20.00		85,000	50,000	5	35	77,000	23,000		
20.00		80,000	55,000	10	50	70,000	18,000	19.0†	
20.00		115,000	55,000	2*e*	30*e*				

f Corning Glass Works.
g Yield point taken as the load producing an extension under stress of 0.75%
j Average linear coefficient per degree Centigrade from 25 to 300° C. Tests on rod. Scientific Paper No. 410, U. S. Bureau of Standards.
n Guertler—Tammann constitution diagram.

These figures should not be used for specification purposes because they are subject to manufacturing limitations which may alter the values—See page 162.

MATERIAL	Alloy No.	Form	Approximate Composition, Per Cent.				Tensile Strength, Lbs./Sq. In.		Elongation, Per Cent. in 2 In.		(g) Yield Point, Lbs./Sq. In.		Young's Modulus of Elasticity P.S.I. x 10^{-6}	Rockwell Hardness No., "B" 1/16" Ball, 100 Kg.		Melting Point, Deg. Cent.	Density, Lbs. Per Cu. In.	Coefficient of Expansion (j)	Electrical Conductivity, Per Cent. I.A.C.S. at 20° C.	Thermal Conductivity (u)
			Copper	Zinc	Lead	Tin	Hard (a)	Soft	Hard (a)	Soft	Hard (a)	Soft	Hard (a)	Hard (a)	Soft					
Copper		Sheet	99.90+				51,000	32,500	4	37	48,000	12,000	16.0	58	Too Soft	1083c	0.322	.0000177	100.0	0.9225
		Wire	99.90+				60,000	38,000	3e	36e	39,000									
		Rod	99.90+				50,000	32,000	18	38	46,000	15,000								
Deoxidized Copper		Tube	99.90ph				50,000	35,000	10	35	48,000			58	Too Soft	1083b	0.323	.0000177		
		Sheet	99.90ph				55,000	35,000	5	35	44,000	16,000		61						
		Rod	99.90ph				58,000	35,000	5	38		15,000	16.0							
		Wire	99.90ph				60,000	35,000	2.6e	35										
Commercial Bronze–95%	‡	Sheet	95.00	5.00			55,000	35,000	5	38	39,000	11,000	15.0	68		1065x	0.320	.0000181	54.6	0.576
Commercial Bronze–90%	‡	Sheet	90.00	10.00			67,000	37,000	3	40	53,000	11,000	15.0	75	1	1045x	0.318	.0000182	40.90	0.446
Red Brass–85%	‡	Sheet	85.00	15.00			75,000	42,000	4	43	71,000	18,000	15.0	82	10	1020x	0.316	.0000187	37.0	0.38
		Tube	85.00	15.00			68,000	42,000	6	42	64,000	19,000								
Red Brass–80%	‡	Sheet	80.00	20.00			85,000	43,000	4	50			15.0	86	11	1000x	0.313	.0000191	32.5†	0.335
		Wire	80.00	20.00			125,000	49,000	2e	43e									28.1y	
Brazing Brass	‡	Sheet	75.00	25.00			80,000	47,000	5	45				87		980x	0.310	.0000196	30.0†	0.31
Spring Brass	‡	Sheet	72.00	28.00			76,000	47,000	4	55	38,000		14.0	88	20	965x	0.309	.0000198	28.60	0.295
Cartridge Brass	‡	Sheet	70.00	30.00			86,000	45,000	4	50				87		955x	0.308	.0000199	27.58	0.290
Cartridge Brass	‡	Sheet	69.00	31.00			85,000	46,000	4	58				87	22	950x			27.60	0.290
Eyelet Brass	‡	Sheet	68.00	32.00			78,000	46,000	5	58	55,000			87	22	945x	0.307		27.30	0.289
Drawing or Spinning Brass	‡	Sheet	66.67	33.33			76,000	46,000	5	52				86	20	938x	0.306	.0000201	25.85	0.287
Yellow Brass	‡	Sheet	65.00	35.00			76,000	45,000	5	60			14.0	85	30	930x	0.306	.0000202	26.8	0.285
		Rod	65.00	35.00			70,000	45,000	15	50		12,500								
Yellow Brass	61	Rod	63.00	37.00			70,000	50,000	12	50			14.0			920x	0.305	.0000205	25.95	0.285
		Sheet	63.00	37.00			84,000	48,000	4	50										
		Wire	63.00	37.00			125,000	50,000	2e	50e										
Muntz Metal	‡	Sheet	60.00	40.00			80,000	57,000	9.5	48		20,000	12.8	87	42	905x	0.303	.0000208	28.60	0.300
Cap Gilding	201	Sheet	90.00	9.60	0.40		65,000	39,000	4	35									42.10	
Yellow Brass	218	Tube	67.50	32.00	0.50		50,000	44,000	5	45		17,000	14.0†				0.307		26.8	
Butt Brass	229	Sheet	64.00	35.00	1.00		80,000	45,000	5	60				85	15					
Leaded Commercial Bronze	202	Rod	88.50	10.00	1.50		60,000	35,000	3	30			15	58			0.319	.0000183	40.50y	0.432
Leaded Red Brass–80%	205	Rod	78.50	20.00	1.50		80,000	40,000	5	35							0.314	.0000192	28.91y	
Leaded Brass	211	Rod	69.00	29.50	1.50		84,000	45,000	3	34	33,000						0.309	.0000200	27.55	

Variations must be expected in practice.
‡ Manufactured in several alloys each with slight variation.
a For some alloys the figures given are for a temper slightly different from that commonly known as "Hard".
b Determination.
c Circular No. 73, U. S. Bureau of Standards.
e Elongation of wire, percent. in ten inches.
g Yield point taken as the load producing an extension understress of 0.75%.
j Average linear coefficient per degree Centigrade from 25 to 300° C. Tests on rod. Scientific Paper No. 410, U. S. Bureau of Standards.
ph Phosphorus present.
u Cal. per sq. cm. per cm. per sec. per degree Centigrade at 20° C.
x Bauer and Hansen constitution diagram.
y Hard at 25° C.
† Soft.

See reverse side

CHEMICAL AND PHYSICAL PROPERTIES

These figures should not be used for specification purposes because they are subject to manufacturing limitations which may alter the values—See page 162.

MATERIAL	Alloy No.	Form	Approximate Composition, Per Cent.				Tensile Strength, Lbs./Sq. In.		Elongation, Per Cent. in 2 In.		(g) Yield Point, Lbs./Sq. In.		Young's Modulus of Elasticity P.S.I. x 10^{-6}	Rockwell Hardness No. "B" 1/16" Ball, 100 Kg.		Melting Point, Deg. Cent.	Density, Lbs. Per Cu. In.	Coefficient of Expansion (j)	Electrical Conductivity, Per Cent. I.A.C.S. at 20° C.	Thermal Conductivity (u)
			Copper	Zinc	Lead	Tin	Hard (a)	Soft	Hard (a)	Soft	Hard (a)	Soft	Hard (a)	Hard (a)	Soft					
Clock Brass	243	Sheet	61.50	37.00	1.50		80,000	45,000	4	40				87	13					
Forging Brass	250	Rod	60.00	38.00	2.00		70,000	50,000	10	45	31,000	22,000					0.305		26.5†	0.258
Free Cutting Yellow Brass	271	Rod	62.00	35.00	3.00		62,000	47,000	20	60	52,000	32,000	15.0	77	16	885*b*	0.307	.0000204	25.0	0.258
Oreide	420	Sheet	87.25	11.50		1.25	80,000	45,000	4	40										
Admiralty	442	Sheet	70.00	29.00		1.00	95,000	45,000	5	60						935*b*	0.308	.0000202	24.65	0.263
		Tube	70.00	29.00		1.00		55,000		60										
Naval Brass	452	Rod	60.00	39.25		0.75	62,000	54,000	25	40								.0000214		
Tobin Bronze	452	Rod	60.00	39.25		0.75	75,000	54,000	25	50	60,000	25,000	15.0	75		885*b*	0.304	.0000211	24.93	0.279
		Sheet	60.00	39.25		0.75	90,000	54,000	4	40		25,000		93	55					
Fourdrinier	436	Wire	81.00	18.75		0.25		49,000		43*e*							0.315		32.20	0.341
Special Bronze	356	Sheet	98.75			1.25	65,000	40,000	4	48				71		1075*z*	0.321		43.0	0.520
Signal Bronze	361	Wire	98.25			1.75	100,000	50,000	3*e*	33*e*						1070*z*	0.321		35.0	0.350
Phosphor Bronze	903	Sheet	96.00*ph*			3.75	90,000	45,000	4	50		18,300	15.0	90	30	1050*z*	0.320	.0000190	12.62†	0.150
Phosphor Bronze	351	Sheet	95.00			5.00	100,000	50,000	3	55	87,000	23,000	15.0	96	30	1050*z*	0.320	.0000178	18.37	0.195
Leaded Phosphor Bronze	979	Rod	94.00		1.00	5.00		50,000		40		20,000					0.322		18.37	0.199
Phosphor Bronze	353	Sheet	92.00			8.00	110,000	55,000	3	70	85,000	25,000	14.0	99	38	1025*z*	0.318	.0000182	13.00	0.150
Phosphor Bronze	354	Sheet	89.50			10.50	115,000	60,000	5	65	95,000	40,000		100	52	1000*z*	0.317	.0000183	10.6	0.121
Free Cut'g Phosphor Bronze	610	Rod	88.00	4.00	4.00	4.00	60,000		20		50,000		15.0	75			0.320		12.21	0.133
High Strength Bronze	364	Wire	97.25*si*		*Nickel*	2.00	120,000	45,000	3*e*	36						1022*b*			12.0	
Super-Nickel	701	Tube	70.00		30.00			65,000		30						1225*n*	0.323	.0000162*f*	4.75	0.069
20% Cupro Nickel	712	Sheet	80.00		20.00		85,000	50,000	2	30				85	37.5	1200*n*	0.323		6.47	0.087
15% Cupro Nickel	736	Sheet	85.00		15.00		70,000	45,000	3	30	51,000					1175*n*	0.323		8.17	0.112
30% Nickel Silver	703	Sheet	47.00	23.00	30.00		130,000	72,000	2	35					61	1140*v*	0.316		3.58	
		Wire	47.00	23.00	30.00		160,000	75,000	1*e*	35*e*										
Ambrac	854	Sheet	65.00	5.00	30.00		105,000	65,000	2	30				96	32	1220*b*	0.320	.0000162*f*	4.47	0.068
		Rod	65.00	5.00	30.00		85,000	65,000	10	30			20.0							
		Wire	65.00	5.00	30.00		130,000	65,000	2*e*	30										
25% Nickel Silver	707	Sheet	55.00	20.00	25.00		110,000	72,000	4	30					60	1135*v*	0.315		4.00	
Ambrac	850	Sheet	75.00	5.00	20.00		85,000	50,000	5	35	77,000	23,000		88	25	1150*b*	0.320	.0000164*f*	6.2	0.092
		Rod	75.00	5.00	20.00		80,000	55,000	10	50	70,000	18,000	19.0†							
		Wire	75.00	5.00	20.00		115,000	55,000	2*e*	30*e*										

Variations must be expected in practice.

a For some alloys the figures given are for a temper slightly different from that commonly known as "Hard".

b Determination.

e Elongation of wire, percent. in ten inches.

f Corning Glass Works.

g Yield point taken as the load producing an extension under stress of 0.75%

j Average linear coefficient per degree Centigrade from 25 to 300° C. Tests on rod. Scientific Paper No. 410, U. S. Bureau of Standards.

n Guertler—Tammann constitution diagram.

ph Phosphorus present.

si Silicon .75%.

u Cal. per sq. cm. per cm. per sec. per degree Centigrade at 20°C.

v Tafel constitution diagram.

z Heycock—Neville constitution diagram.

† Soft.

See reverse side

These figures should not be used for specification purposes because they are subject to manufacturing limitations which may alter the values—See page 162.

Material	Alloy No.	Form	Approximate Composition, Per Cent.						Tensile Strength, Lbs./Sq. In.		Elongation, Per Cent. in 2 In.		(g) Yield Point, Lbs./Sq. In.		Young's Modulus of Elasticity, P. S. I. x 10^{-6}	Rockwell Hardness No. "B" 1/16" Ball, 100 Kg.		Melting Point, deg. Cent.	Density, Lbs. Per Cu. In.	Coefficient of Expansion (j)	Electrical Conductivity, Per Cent. I.A.C.S. at 20° C.	Thermal Conductivity (u)
			Copper	Zinc	Nickel	Lead	Iron	Tin	Hard (a)	Soft	Hard (a)	Soft	Hard (a)	Soft	Hard (a)	Hard (a)	Soft					
18% Nickel Silver	719	Sheet	65.00	17.00	18.00				90,000	58,000	3	40	83,000		18.0	91	40	1110v	0.316		5.91	0.080
18% Nickel Silver	724	Sheet	55.00	27.00	18.00				100,000	60,000	2	40				95	40	1055v	0.314		5.56†	
18% Nickel Silver	723	Wire	56.00	26.00	18.00				143,000	60,000	1e	40e			14.1				0.314		5.49	0.071
15% Nickel Silver	739	Sheet	64.00	21.00	15.00				93,000	58,000	5.5	40				92	33	1075v	0.314		6.26	0.081
15% Nickel Silver	741	Sheet	57.00	28.00	15.00				95,000	55,000	2	35						1030b	0.312			
Leaded Nickel Silver	745	Sheet	61.00	25.00	12.50	1.50			90,000		5					88						
10% Nickel Silver	752	Sheet	65.00	25.00	10.00				90,000	50,000	3	45		11,000	17.5†	82	32	1010v	0.313		8.27	0.110
5% Nickel Silver	771	Wire	63.00	32.00	5.00				135,000		2e							960v			11.99	0.140
Ambraloy	901	Sheet	95.00			5.00 (Aluminum)			105,000	52,000	5	70				93	20	1060t	0.295		17.69	0.198
Ambraloy	928	Sheet	92.00			8.00 (Aluminum)			120,000	60,000	4	60	60,000		15.0	99	30	1040t	0.281	.0000179	14.80k	0.173
		Rod	92.00			8.00 (Aluminum)			100,000	60,000	4	60										
Ambraloy	930	Rod	89.50			8.00 (Aluminum)	2.50		125,000	72,000	5	50	80,000	35,000		100	52		0.280		10.9	
Ambraloy	929	Rod	90.00			10.0 (Aluminum)			125,000m	78,000	5m	36	67,000	41,000		100	65	1040t	0.273		13.5	0.157
Avialite	915	Rod	90.00			9.50 (Aluminum)	0.50		88,000		35		43,000					1042b	0.274	.0000169	12.61	0.144
Calsun Bronze	951	Wire	95.50			2.50 (Aluminum)		2.00	135,000	50,000	4e	35e						1054b	0.308		17.0	
Manganese Bronze	932	Rod	57.00	40.00	0.10 (Manganese)		1.45	1.45	90,000	65,000	15	45										
Manganese Bronze	937	Rod	59.00	39.00	0.50 (Manganese)		0.80	0.70	85,000	60,000	20	45				90			0.302		24.6	0.241
Everdur	1010	Sheet	96.00		1.00 (Manganese)	3.00 (Silicon)			113,000	55,000	5	48	75,000	20,000		95	40	1019b	0.308	.0000180	6.7	0.078
		Rod	96.00		1.00 (Manganese)	3.00 (Silicon)			95,000	55,000	15	85	75,000	20,000	15.0							
		Wire	96.00		1.00 (Manganese)	3.00 (Silicon)			145,000	59,000	5e	50e	95,000	25,000								
Everdur	1015	Tube	98.25		0.25 (Manganese)	1.50 (Silicon)			65,000	40,000	15	60	60,000	10,000		75	20	1055r	0.316			
		Rod	98.25		0.25 (Manganese)	1.50 (Silicon)			70,000	40,000	6	60		10,000							12.0	0.129
		Sheet	98.25		0.25 (Manganese)	1.50 (Silicon)			70,000	40,000	6	46	65,000	10,000		80	3					
Hitenso A	960	Wire	99.35			0.65 (Cadmium)			75,000		3e		47,000		15.6			1080h	0.3212		85.0	
		Sheet	99.35			0.65 (Cadmium)			54,000		5					62						
Hitenso BB	961	Sheet	99.00			1.00 (Cadmium)			60,000	35,000	3	50				65		1076h	0.3212		80.0y	0.824
		Wire	99.00			1.00 (Cadmium)			92,000	35,000	3e	50e									80.0y	
Hitenso C	965	Sheet	98.60			0.80 (Cadmium)		0.60		36,000		50		15,000				1070b	0.3212		55.0y	0.556
		Wire	98.60			0.80 (Cadmium)		0.60	99,000	40,000	4e	45e									55.0y	
Extruded Architect'l Bronze	280	Shapes	57.00	40.00	2.50 (Lead)		0.16	0.34	70,000	50,000	10	20						884b	0.305			
Beryllium Copper	175	Sheet	97.40	2.25 (Be)	0.35 (Nickel)				118,000	70,000	4.3	45.0	105,000	31,000	17.2	102	65-73	955b	0.297±.01	.0000170*	17±	0.25p
		Sheet	97.40	2.25 (Be)	0.35 (Nickel)				193,000m	175,000p	2.0m	6.3p	138,000m	134,000p	18.4m	114m	112.5p				18-25	0.20m

Variations must be expected in practice.
a For some alloys the figures given are for a temper slightly different from that commonly known as "Hard".
b Determination.
e Elongation of wire, percent in ten inches.
g Yield point taken as the load producing an extension under stress of 0.75%.
h Jenkins and Hanson constitution diagram.
j Average linear coefficient per degree Centigrade from 25 to 300° C. Tests on rod. Scientific Paper No. 410, U. S. Bureau of Standards.
k At 18.1° C.
m Cold worked and heat treated.
p Annealed, quenched and heat treated.
r Smith constitution diagram.
t Stockdale constitution diagram.
u Cal. per sq. cm. per cm. per sec. per degree Centigrade at 20°C.
v Tafel constitution diagram.
y Hard at 25° C.
† Soft. *per °C. from −50 to +50 °C.

See previous page

ANACONDA ALLOYS

CHEMICAL AND PHYSICAL PROPERTIES

(*See Data Shown In This Folder*)

The values given are, in most cases, for "Hard" Rolled or Drawn Metal, and for "Soft Annealed" Metal, and represent averages that may be expected in commercial practice.

Higher values for Tensile Strength, Yield Point, Elastic Limit, and Hardness may be obtained by a greater amount of working, and, in the same manner, figures between those shown for "Hard" and "Soft" may be obtained by a lesser amount of working than that used to obtain "Hard" Temper.

IMPORTANT

Because of manufacturing limitations which may, in some cases, alter the values, it must be understood that the properties shown in these tables are not to be used for specification purposes, but should be considered only as a general guide. Our Technical Department is, however, prepared to supply specific information for individual conditions, providing it has full details regarding dimensions, applications, etc.

THE AMERICAN BRASS COMPANY
General Offices
WATERBURY, CONNECTICUT